

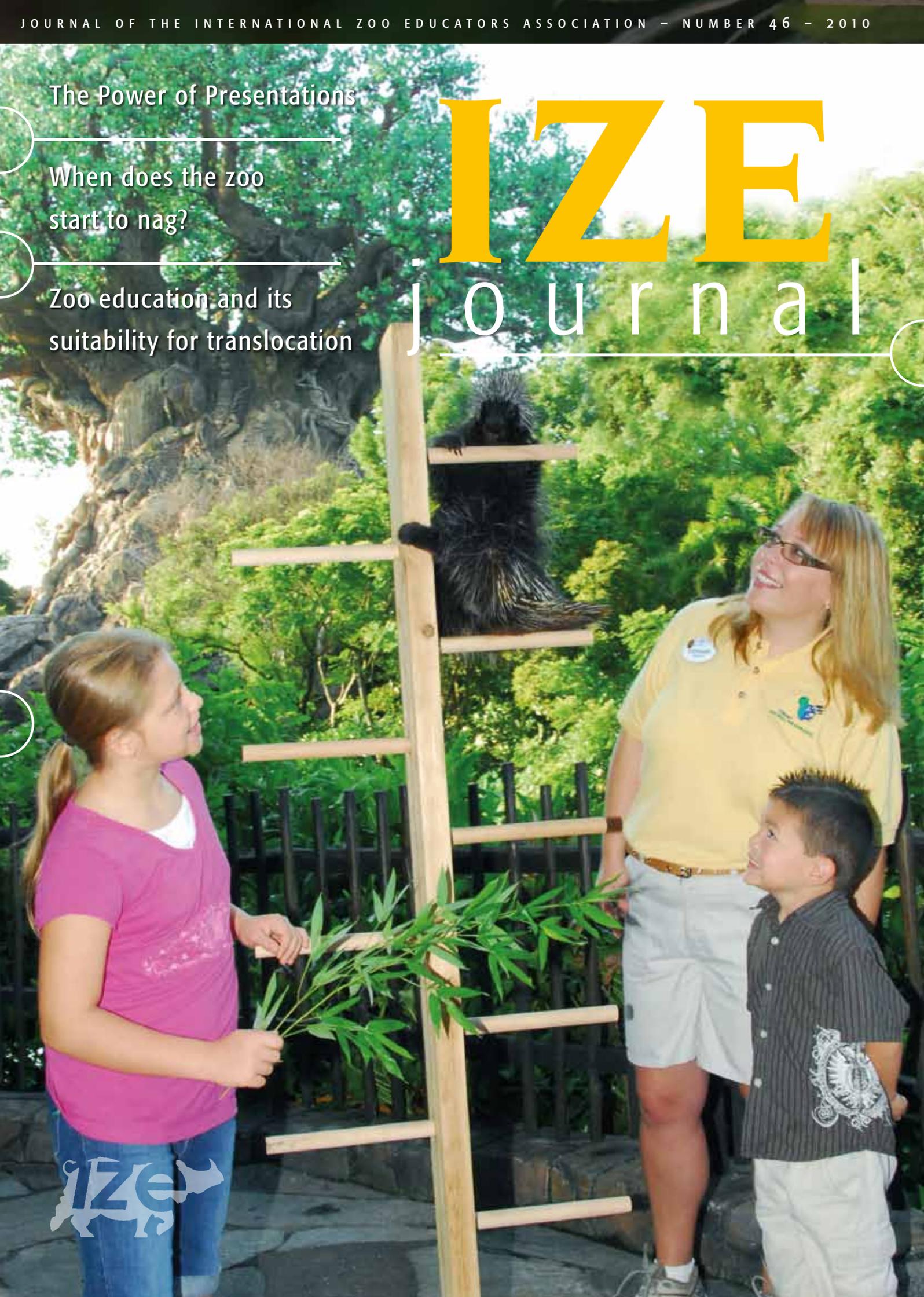
The Power of Presentations

When does the zoo
start to nag?

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IZE

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A note from the IZE President

Stephen McKeown

HEAD OF DISCOVERY AND LEARNING |
CHESTER ZOO | UNITED KINGDOM



This will be my last President's column as I'll be stepping down in October when Kathy Lehnhardt of Disney's Animal Kingdom will take over as our new President. I know that Kathy will be an excellent successor and I look forward to supporting her in my role as Immediate Past President. Various other board members, having served their maximum terms of office, will also be moving over to be replaced by new members. On behalf of all IZE members I'd like to express my gratitude to those leaving for all their hard work and commitment and, in welcoming the newcomers, wish them well in their roles.

Some of you may know that the WAZA/IZE Office has moved further south from Bern to the IUCN's newly-built conservation centre in Gland, by Lake Geneva. This prestigious address should offer great networking opportunities in this nest of conservation communities.

By the time you read this we should also have in place a Memorandum of Understanding between WAZA and IZE, further cementing and formalizing the relationship between the two groups.

Silvia Geser, who had so efficiently administered our affairs in the IZE office, left during 2009 to pursue a PhD at Bern University. We thank her for her considerable efforts in keeping the membership and so many other areas of our operations running smoothly and wish her well in her studies. Monica Gamp is the new person running our affairs and is rapidly familiarizing herself with the zoo education world!

One of Monica's first jobs will be to organize the attendance of ten sponsored educators at our forthcoming conference. Kathy and I, with Stephanie Arnett's help, scored the 26 applications we received, in an effort to make the selection process more objective. This, we think, has worked well and we'll continue to refine the process going forwards.

2010 will be remembered as the year we made a real effort to operate more sustainably as an organisation with a move away from paper based communications where possible. It may be that in the future the IZE Journal becomes digital but we thought, for the time being, there was value in continuing with a physical product that people can pick up and browse through. At the time of writing we are preparing for the first time to conduct an electronic ballot, eliminating the need for actual ballot papers to be sent out to the members.

I'm looking forward very much to seeing old friends and new faces at our 20th IZE Biennial Conference in Florida in October and reminding myself what a privilege it has been to serve this great organisation of ours and to work with you all in expanding the impact of our vital work globally.

Editorial

Natasha Silva

EDUCATION PROJECTS
MANAGER | ARTIS
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My first memorable encounter with nature was when I was almost three years old. I was in the driveway of our home on Aruba, watching an army of ants diligently ploughing back and forth from their nest with large food items and waste products. I had just opened the gates and my mother was about to drive the car over them; the idea filled me with such distraught that my mother obligingly parked elsewhere.

I consider myself blessed in that I grew up in a family of nature lovers and I spent much time outdoors. My youth was rich in hands-on, wonderful experiences in nature. It is precisely these enriching experiences and resulting values that I wish to pass on to my children (and grandchildren).

Research – especially from America – shows that children who have an awesome experience with nature before their teens are more likely to become environmentalists. Moreover, it seems that the best experiences are when children get to interact directly with animals (e.g. get splashed by a dolphin, touch a snake, etc), not just look at them.

At a time of critique concerning the impact of zoos' education programmes, some environmental and governmental agencies are redirecting part of their funding towards programs in zoos' in acknowledgement of their potential as ambassadors in nature conservation. Hence, by focussing our efforts - ex-situ as well as in-situ - on becoming outstanding actors in and sites for bringing people in touch with (local, regional and 'exotic') nature, and by proving our cause and effect through (ground-breaking) research and evaluation, zoos can really make a difference and become leading institutions in forwarding nature conservation!

Connecting Children with Nature



Photo © Disney's Animal Kingdom



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The IZE Journal is a medium for promoting the IZE mission and highlighting conservation education trends, initiatives, efforts and achievements of IZE members.

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Are We Evaluating Children's Nature Experiences?

by **Kathy Lehnhardt** CURATOR OF EDUCATION | DISNEY'S ANIMAL KINGDOM | USA

The theme of the 2010 International Zoo Educators Conference is "Connecting Children to Nature."

Why is this theme so relevant for conservation educators today? A number of past studies (Chawla 2006) have investigated which life experiences have motivated people to act to protect the environment, and when in their lives, people had these experiences. Researchers found that people in the United States and Europe consistently point to the same kinds of life experiences, mainly in childhood, as profoundly influencing their later environmental interests and activism. So, if we want an informed and environmentally-supportive voting public who care about wildlife then connecting children with nature is a priority.

If we want an informed and environmentally-supportive voting public who care about wildlife then connecting children with nature is a priority.

Zoos and aquariums with their breathtaking animals, audiences largely comprised of families with young children, and professionally-trained educators working on site, are arguably some of the best places to watch this child-nature connection unfold.

But not all are believers.

In 2006, Dr. Chris Kuhar opened his presentation at the 18th International Zoo Educators' (IZE) Biennial Conference by paraphrasing an eminent primatologist's article that said that education has not been proven to be an effective tool in the field of conservation.

Although many conservation educators may disagree with this statement, it is true that there is very little evaluation data on conservation education with children. In fact, in reading through the new special issue of the *American Journal of Primatology* on conservation education (Volume 2, Issue 5, May 2010) I am astounded at how many times the various authors state that only a limited number of quantitative studies that measure the effect of conservation education have been published.

For an education program to achieve long-lasting effects, a change in knowledge, attitude, and behavior has to occur. These are all measurable as long as we as educators include evaluation as part of our programs.

At a February 2010 *in-situ* conservation education workshop held at the Brevard Zoo in Florida (USA), many educators presented wonderful educational materials that they had created and/or purchased, brought to developing countries and trained in workshops. However, few were evaluating these materials or their impact on teachers, students and wildlife conservation. How were these materials used by the teachers once in the classroom? How did students respond to these new materials? Did any change occur in students' willingness to adopt positive wildlife behaviors after participating in the program? Were there any changes in the conservation of a species or ecosystem due to the education program (e.g. reduction in snares, less wood being removed from the forest, reduction in eating bushmeat, increase in species numbers from census data, etc.)? Biological changes are perhaps the hardest to identify which is why longitudinal studies are most important when assessing changes in species and/or ecosystems over time.

It seems clear that to become creditable in the education and conservation fields, conservation educators need to evaluate and publish their work.

It sounds so easy, but we know that evaluation isn't easy. If it were, we'd all be doing it. Time, funds, negative information, design, and knowledgeable partners in statistical analysis of data are challenges that may cause barriers to including evaluation components in our education programs and projects that involve children.

But once evaluation results are obtained, the rewards are great. Educators can state percentages and results about their program's conservation impact with conviction. Funders will be more supportive of projects with clear evaluation results. And educators have data

that confirms their target audience is leaving a program with the intended messages. So, when you are planning your next conservation education program think about what research questions you might want answered about the program's impact on children's wildlife conservation. Develop partnerships with scientists who can help you analyze your evaluation data. There are many social scientists working in universities or in the private sector who would be eager to work on non-formal education projects. Then identify a journal that might accept your data. Some journals to consider are the: Journal for Environmental Education, Journal of Interpretation Research, Curator, Journal of the Visitors Studies Association, Zoo Biology, Applied Environmental Education and Communication.

With evaluation in hand, conservation educators will move the field of wildlife education into the 21st century, increase their credibility in both the conservation and education fields, and rest well at night knowing that their education efforts are making an impact on wildlife conservation.



Photo © Disney's Animal Kingdom

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 Kathy Lehnhardt is IZE President Elect (Vice President).

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What questions are conservation educators asking about children and nature experience?

- What knowledge do children take away from a nature experience?
- Does a positive change in conservation knowledge, attitudes and behaviors persist over time?
- How does a zoo-based nature experience change children's attitudes about nature? Do these changes persist into adulthood?
- How interested are children in initiating positive conservation behaviors after participating in an education program?
- What barriers do parents perceive in assisting children with nature activities?
- What are the pre-existing conservation knowledge, attitudes, and behaviors of children visiting zoos and aquariums, and how do these entering characteristics contribute to changes in their understanding of animals and conservation?
- Does a nature experience for children lead them to adopt or enhance caring attitudes toward wildlife?
- Do children spend more time outdoors as a result of a conservation education program?
- Do children have a heightened awareness of their surroundings as a result of a conservation education program?



The Roles of Zoos and Aquaria in Connecting Children with Nature

by **Bill Street** HEAD OF EDUCATION AND CONSERVATION | SEA WORLD AND BUSCH GARDENS ZOOLOGICAL PARKS | USA

As a parent, I often compare how my daughters are growing up to my childhood. I grew up in a small farming community and the typical summer day was unstructured exploration of the world around me. Early each morning the neighborhood pack of kids would jump on their bikes and ride into the woods to build forts, hunt for frogs and crayfish at the pond, and build unsuccessful dams in the creek. We often went the entire day with little parental supervision, and our favorite days were spent being active, outdoors, social and independent. By just being in nature, we learned about it and our place in it and it helped shape us into the people we are today. This is where many of us developed our conservation ethic and love for the outdoors.

Over the past 25 years, things have changed.

Kids have become increasingly alienated from the natural world and have replaced time outside with time in front of the television or computer. Real experiences have been replaced with the virtual world. Frogs and mice have been replaced with computers with a mouse. As parents, we have become frightened from the media to the point where it is considered irresponsible to let your child play in the backyard without supervision.

In Richard Louv's book *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*, he details how our children's lives have gotten out of balance. There are more children today that are obese than any time in recorded history. The use of prescription medication



Photos © Matt May / Bush Gardens Tampa Bay



to treat behavioral disorders has increased tenfold. Academics have become so competitive that unstructured time for students to explore and discover on their own is nearly non-existent in the curriculum, having been replaced with education standards and after school activities. Parents and children are both completely “scheduled” to the point where they literally cannot stop and smell the roses. And, most disturbing, children today are not developing an environmental ethic that is critical to the protection and conservation of our natural resources.

Children today are not developing an environmental ethic that is critical to the protection and conservation of our natural resources. At the same time, there has been increased criticism over the impact of zoological education programs. Critics of zoos point to the lack of research and evidence that zoos help people gain a better appreciation for wildlife and claim that viewing animals at zoos is not an impactful way to encourage people to take actions to conserve wildlife. Zoos counter that despite the difficulty in measuring direct behavioral change, that doesn’t mean it doesn’t exist and point to countless visitor studies that show attitudinal change in zoo visitors vs. non-visitors.

As a zoological educator, I believe that one of our most important responsibilities is to reconnect children with nature in meaningful ways. Nearly all zoological facilities have a mission to enhance public understanding of wildlife and the conservation of the places animals live, but this is only the start. We need to identify more ways to move children from the inspiration that they get from visiting our facilities to one of taking action and encouraging the entire family to explore the zoo in their own backyards. We need to find more ways to directly connect experiences at zoos with outcomes that encourage behavior change. By taking action, children are reinforced that their actions make a difference and that the decisions that we all make have lasting effects on our environment, resulting in future generations that are better prepared to make decisions about the conservation of our environment.

Here are two simple examples of what zoos can do to encourage children to take action:

Demonstration Backyard Habitats

The National Wildlife Federation (www.nwf.org), a large non-profit conservation organization, created a program nearly 30 years ago that encouraged

homeowners to landscape and plant their property to benefit wildlife. They created a certification program where homeowners could provide the basic necessities of life for their local fauna and certify their home as a wildlife habitat. The program encourages thoughtful use of pesticides and fertilizers, use of native flora and an increase in the amount of time families spend outdoors in a safe environment. Over the years this program has grown to over 100,000 certified backyards and hundreds of schoolyard habitats. Every spring, countless families enjoy observing and connecting local wildlife in their own backyards. Entire communities have even become certified and a variety of Wildlife Watch programs have been supported with this citizen scientist initiative.

Some zoos in the United States have begun to install demonstration backyard habitats in the hopes of encouraging their visitors to create wildlife habitats on their property. Imagine the conservation impact if even a small percentage of our zoo visitors decided to participate in this effort. The result could not only help our visitors connect with nature in meaningful ways, but also result in the creation of thousands of acres of wildlife habitat.

Engaging Children in Grassroots Conservation Programs

In the summer of 2009, Busch Gardens wanted to measure their ability to get their 1,000 summer camp participants to take actions that help conserve their environment. During the week of camp, all of campers learned about local wildlife species and coastal habitats in their community and were able to meet, interact and connect with several native animals. During lunch, students participated in planting seedling upland plants and creating a shoreline marine grass wetland nursery. At the end of each week's camp, the students took the plants to a greenhouse where they continued to grow. By the end of the summer, they had planted over 2,000 upland plants and 5,000 wetland grasses. Over the next six months, the students received updates on the progress of plants, were encouraged to become members to local non-profit conservation organizations, and were invited to a celebratory restoration event where their plants would be used to help restore a section of Tampa Bay. Six months after the end of camp, nearly 50% of the campers and their families showed up on a dreary Saturday morning to plant their upland and wetland plants and help preserve their local environment. Nearly all of the students and their families had never participated in a restoration event before.



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September 28 – October 2 2010 20th IZE Biennial Conference

Hosted by Disney's Animal Kingdom

The 20th IZE Conference will be held at Disney's Coronado Springs Resort at Lake Buena Vista in Florida. The theme for the conference will be 'Connecting Children to Nature'. The conference will feature great exchanges with zoo educators and field experts from around the world, paper presentations, open space sessions and more! Participants will also visit Busch Gardens as part of the conference program.

For more information and bookings visit www.izea.net

At the 20th International Zoo Educators' (IZE) Biennial Conference in Orlando, Florida (USA) this September, we will be sharing ideas on how to better engage children in conservation action and ways that we can measure the ability of our zoos to encourage conservation behavior.

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Bill Street is IZE Regional Representative for North America.

Bill Street has been an environmental educator for over 15 years, teaching kids about the wildlife and wild places around them. He heads the Education and Conservation Departments at the SeaWorld and Busch Gardens zoological parks in the United States. His career has included positions at several major aquaria throughout North America and he was the Senior Director of Education at the National Wildlife Federation.

2010 International Year of Biodiversity: zoo's role in teaching zoology as a holistic subject



by Louise Gordon EXECUTIVE MANAGER MARKETING AND EDUCATION | JOHANNESBURG ZOO | SOUTH AFRICA

Often when speaking to educators at schools in Johannesburg, South Africa, one gets the impression that zoology is broken into so many segments, according to the curriculum, that some educators struggle to see the relevance of linking these different segments, for example – they focus on ecology but fail to see how it connects to conservation.

When they do classification, they struggle to see that the very animals they are using as examples in classification are the ones that are endangered and can be incorporated into an ongoing lesson plan. If educators struggle with these concepts, how do learners form a holistic concept of zoology?

As zoo educators we may be guilty of contributing to the problem. We are often intent on educating about a specific topic in limited time periods and fail to provide or refer to the wider connections for the

participants. Frogs are classic examples, not the most charismatic animals to most, but often the only example used when talking about Amphibians as a Class. However, when we want to talk about conservation and inspire our audience to participate and become emotive – we often do not include frogs but would rather go for cheetahs or the cute tiger cubs. There are obvious reasons for using charismatic species as you do want to create the 'ah cute' emotive moment and you may be able to get people to sign up or contribute far more easily than with non-charismatic





animals. These animals are also on display in our zoos and we educate about the plight they face in different countries. If one ignores the animals we actually live with in our day to day lives, we can face the danger of distancing our audiences from conservation, instead of making them an integral part of the process. If you live in Johannesburg, what can you really do, apart from raising money, to save Siberian tigers? So conservation may become something that you pay for so that somebody else can do it. There is no close connection to your life and so no consequent changes to how you live. Even when raising awareness – does this really inspire our audiences to look at the way they live? Our audiences may find it more difficult to believe

our messages of saving the planet (reduce, reuse, recycle and rethink) in order to save animals they do not live with. Conservation, like charity, starts at home and this is where we can encourage the most participation and necessary changes required to reduce our effect on our environment. Our education programmes should always be aimed at making our audiences part of conservation and not just a passive crowd that loves animals but carries on killing the planet. When using examples for teaching our topics, we should look at a holistic picture. Again let's look at the example of the amazing frogs that are found in Johannesburg. People see them in their gardens, see them crossing roads, hear them at night and often refer to them when discussing warts and witches. Can we include them in ecology, classification, conservation and biodiversity? A resounding yes! By teaching in a holistic manner, we can connect some of the dots and explain what would happen to that food web if the frogs become extinct? Why would they become extinct? There are many reasons including the use of harmful chemicals for cleaning clothes or dishes, polluting water bodies. Let's make audiences aware of their choices when shopping and their direct connection to conservation. City people are often not connected to nature, but the loss of frogs has a direct influence on their quality of life. A result of the loss of frogs can be that millions of mosquitoes breed without control.



I have yet to meet a person who truly loves a mosquito. In general they are regarded as irritating pests, causing loss of sleep, the cause of some serious illnesses and costing us money. See what happens if we don't look after the animals we live with!

It is an essential part of our education programmes to make sure that we connect our audiences with their effect on nature and how easy it is to contribute to a better way of life. Their effect is not just restricted to their own small area but has an influence on the rest of the world.

Global campaigns can be ignored by some institutions as they do not exhibit the animals featured in these campaigns. This sounds like a contradiction to my first argument. Inland zoos often do not educate about marine animals simply as they do not see the relevance. In Johannesburg Zoo, a five hour drive from our nearest coast line, we participate in the National Marine Week programme. Why is this important for us? Simply because our sister organisations, uShaka aquarium in Kwazulu-Natal and Two Oceans Aquarium in Cape Town, inform us that most of the litter found in our oceans comes from inland cities like Johannesburg. Children living in Johannesburg may have never experienced the sea or seen the beach, let alone any sea-living creature, but they should know where their litter goes and what happens to the pollutants we so easily use. Our effect on our environment is not limited



to our immediate area and by using animals we live with, and nature systems we live in, we can connect to the bigger picture. Our water streams become rivers flowing into the sea, so we are directly responsible. Yet when you include Marine Week in your education programmes, the trick is once again to connect it with your everyday life, the animals you live with, within the nature systems you share with other organisms. In this way global campaigns like 2010 The Year of Biodiversity start making sense as we can connect those dots with our audiences.

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Biodiversity is Life Education Manual

The United Nations General Assembly has declared 2010 as the International Year of Biodiversity. The World Association of Zoos and Aquariums (WAZA) and IZE have created the education manual 'Biodiversity is Life'-aimed at zoo and aquarium educators, teachers and environmentalists.

Check it out on www.izea.net

Exploring the impacts of wildlife tourism on visitors' long-term environmental learning and behaviour

by **Dr Jan Packer** (SENIOR RESEARCH FELLOW) and **Prof. Roy Ballantyne** (HEAD OF SCHOOL OF TOURISM) SCHOOL OF TOURISM | UNIVERSITY OF QUEENSLAND | AUSTRALIA, and **Prof. John Falk** SEA GRANT PROFESSOR OF FREE-CHOICE LEARNING | OREGON STATE UNIVERSITY | USA

Zoos, aquariums and ecotourism experiences have the potential to positively impact visitors' awareness, appreciation and actions in relation to the wildlife they encounter and the environment in general. This paper presents findings from a three-year study of the impacts of wildlife tourism experiences on visitors' environmental learning.

The study investigated how visitors' entering attributes and specific aspects of the experience contribute to changes in visitors' knowledge, attitudes, and engagement in environmentally responsible behaviours. Visitors' memories of their experiences were also analysed to reveal the processes which lead to long-term changes in environmentally responsible behaviours.

The study investigated these impacts at four marine-based wildlife tourism venues in South-East Queensland in order to identify the nature and extent of long-term learning and environmental behaviour change outcomes. More in-depth analyses of the data are reported separately (Ballantyne, Packer and Falk; and Ballantyne, Packer and Sutherland – both under review).



Materials and Methods

Pre- and post-visit questionnaires and follow-up web surveys were administered to visitors of four sites that offered marine wildlife tourism experiences: an aquarium, a marine theme park, a turtle rookery and a whale watching experience.

A total of 1286 visitors completed pre-visit questionnaires that measured entering environmental orientations and motivations; 907 completed post-visit questionnaires that measured aspects of the experience that were important to them, and short-term learning outcomes; and 240 completed follow-up web surveys that measured long-term learning outcomes and recorded people's memories of the wildlife tourism experience. Learning included measures of behaviour change, attitude change and new knowledge that had resulted from the visit.

Results

The nature and extent of long-term learning outcomes

Four months after their visit, 39% of respondents were able to state some new knowledge or understanding they had gained, and still retained, as a result of the experience; 5% reported having questioned their values or changed their personal attitudes; and 7% were able to report some new actions they had taken in support of the environment, as a result of the wildlife tourism experience. These actions included:

- Changing household practices (e.g. not using as many plastic bags and being more careful about what goes down the drain)
- Changing purchasing practices (e.g. avoiding products that would contribute to harming whales)
- Taking responsibility for the environment beyond the home (e.g. picking up rubbish on the street)
- Seeking further information (e.g. on the internet and TV)
- Discussing environmental issues (e.g. with friends and family)
- Volunteering for environmental causes (e.g. neighbourhood clean-ups)

A number of other visitors said they were willing to take action as a result of their experience, but were not aware of the actions they should take.

Predictors of long-term learning outcomes

The relationships among the three sets of variables – visitors' entering attributes, aspects of the experience, and learning outcomes – were analysed statistically in order to identify the best predictors of long-term learning outcomes.



Environmental Orientations that visitors already had when they arrived were important predictors of their response to the experience. People who were already interested in environmental issues were more likely to benefit from the experience: they were more likely to be motivated to learn, they got more out of the experience itself, they were more likely to reflect on the meaning of the experience in their own lives, and they were more likely to learn from the experience.

Experiential engagement, which focussed on what people saw and heard such as the excitement of seeing live animals, having a good view of the animals, seeing plenty of activity, having an engaging and enjoyable experience, was an important predictor of *visitor satisfaction*. It did not contribute directly to visitors' learning outcomes, but it did contribute indirectly, by prompting visitors to *engage reflectively* to their experience.

Reflective Engagement, which focussed on what visitors felt and thought, such as feeling an emotional connection with the animals, reflecting on new ideas about animals and their environments, discussing new information with companions, and feeling sad or angry about environmental problems contributed directly to both short and long-term learning outcomes.

Qualitative analysis of visitors' memories

Analysis of visitors' memories of their wildlife tourism experiences four months after the experience confirmed the findings of the quantitative study, and provided further evidence of a process leading from what people saw and heard (their *sensory* or *experiential engagement*), through what they felt and thought (*emotional* and *reflective engagement*), to what they actually did about it (*behavioural response*).

Experiential engagement. Participants reported quite vivid memories of their sensory impressions, including both visual images and memories involving other

senses, e.g. smells, sounds and the feeling of the breeze. Visitors remembered what it was like to be physically close to the animals. For those visiting zoos and aquariums, this meant that they could get very close to the animals and see them from a new or different perspective. For those visiting ecotourism, being able to get close carried a sense of privilege, and this sense of privilege itself became a long-lasting memory of the experience.

Emotional engagement. Some visitors reported an emotional affinity or connection with the animals they saw. They conveyed a sense of empathy, appearing to understand and enter into the animal's feelings, or felt they had interacted or communicated with the animals. The idea that in the ecotourism settings (whale-watching in particular), the animals had chosen to approach the visitors, led to a heightened sense of privilege and emotional engagement.

Reflective engagement. Visitors' memories contained evidence of a reflective response that did not simply reproduce the factual information that had been given, but showed evidence of further thought or cognitive processing. In some cases, such reflection occurred as a natural response to what people were seeing or feeling. In other cases, reflection was facilitated by the information and interpretation offered as part of the experience. Information visitors were given about the dangers faced by the animals seemed to stay in their

memories longer than factual information about the animals and aroused feelings of protectiveness and concern. This was particularly the case when visitors could actually witness the animals' struggles to survive, or when the information provided by commentaries or signage focussed on the threats posed by human actions.

Behavioural response. Some visitors indicated that the wildlife tourism experience had caused them to reflect on their own role in relation to conservation and to take more personal responsibility than they had previously accepted. As noted above, some reported that they had already taken specific actions in this regard.

Discussion

Many people today feel disconnected from nature. This makes it easier for them to use and discard resources with little thought for the consequences this might have for the natural environment. It follows, therefore, that direct experiences with nature have the potential to reverse this trend (Forestell 1993; Kals et al. 1999). Wildlife tourism offers unique opportunities that allow participants to reconnect with nature in a potentially life-changing way. Many participants in this study were able to recall the information they had been given about human impacts on wildlife, and practical things they could do to make a positive difference. Previous research confirms that wildlife tourists are particularly interested in such messages (Ballantyne et al. 2009).



Making visitors aware of the impact of human actions on the animals they are observing is a powerful means of evoking feelings of protectiveness and concern that may lead to a reflective and/or behavioural response (Ballantyne and Packer 2009).

This study has shed light on the factors that facilitate visitors' progress from experience to action. Of particular note are the importance of developing an emotional affinity for the animals observed and taking time to reflect on the meaning of the experience. Although these findings support the potential of wildlife tourism experiences to effect real change in visitors' environmental behaviour, it is clear that there is still a great deal of room for improvement. In order to increase their long-term impact on environmental actions, wildlife tourism providers may need to find ways of maintaining contact with their visitors, to prompt and support ongoing reflection and action (Ballantyne and Packer, under review).

Conclusions

This research has clearly demonstrated the power of wildlife to evoke lasting memories and transformative experiences. Wildlife tourism managers thus have an enormous opportunity and responsibility to make best use of this resource.

The findings of this study suggest that, in order to evoke powerful memories, enhance the visitor experience, and encourage visitors to adopt environmentally sustainable actions in response to their visit, wildlife tourism managers, interpreters and zoo and aquarium educators should:

- Design interpretive experiences that incorporate multiple senses – especially, sight, sound, smell and touch
- Provide opportunities for visitors to get as close as possible to the animals or see the animals from a new and different perspective
- Use interpretive commentaries and signage to reinforce visitor's sense of wonder, awe, excitement and privilege
- If possible, allow animals freedom to approach visitors, and use this to enhance visitors' sense of privilege
- Encourage visitors to use their imaginations to enter into the animals' world, to identify with individual animals and to experience empathy
- Provide information about the dangers faced by the animals being observed, especially dangers due to human actions
- Give examples of how visitors' everyday behaviours can impact both positively and negatively on the animals being observed, and wildlife in general
- Give examples of practical and achievable things that individuals can do to contribute to the welfare of the animals being observed, wildlife in general, and their own local environment
- Set aside a time and space for visitors to reflect on the meaning of the experience, and to discuss it with companions or family members
- Ensure that staff or volunteer guides are available to answer visitors' questions and initiate conversations, particularly conversations that encourage reflection
- Encourage visitors to spend some time in the days or weeks after the visit to reflect on or discuss their responses to the experience
- Provide resources that visitors can access after the visit to follow up particular interests, extend their learning and maintain their motivation to act

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Be the Solution, Not the Problem

Sustainable Seafood Programme at Ocean Park - Hong Kong

by **Carl Leong** ASSISTANT EDUCATION OFFICER **Carol Liu** EDUCATION OFFICER **and Isabel Li** EDUCATION MANAGER |
OCEAN PARK | HONG KONG

Global fisheries are declining and many commercially important fish have been fished out.

As one of the top ten seafood consumers in the world, Hong Kong plays a key role in becoming part of the solution. With a 580,000 gallon aquarium displaying over 250 species, Ocean Park is the best place to make this happen. In September 2009, Ocean Park launched the Sustainable Seafood Programme for students in Hong Kong.

The Atoll Reef Aquarium.



“Who ate seafood yesterday?”. When our education specialist questioned some secondary school students in the Sustainable Seafood Programme, 18 out of 20 raised their hands. People in Hong Kong love seafood, including the “well-known” (notorious, we would say) shark fin soup, steamed grouper, Filet-O-Fish and sushi. According to the report of the Food and Agriculture Organization of the United Nations (FAO), every single person in Hong Kong consumed an average of 62 kilograms of seafood in 2005. That is 3.6 times higher than the global average, making Hong Kong the third largest per capita consumer of seafood in Asia and the tenth largest in the world. Interestingly, only 10% to 15% of the total seafood consumed in Hong Kong is caught in Hong Kong waters (WWF Hong Kong 2008).

Seafood consumption by Hong Kong people has a significant impact on the global fisheries. Therefore, it is crucial to make Hong Kong people aware of the current fishery problems and persuade them to consume seafood in a responsible way. To this avail, Ocean Park launched its Sustainable Seafood Programme in September 2009.

The Sustainable Seafood Programme

THEME

To enjoy delicious seafood not only now but in the future, we should start supporting sustainable fishery today!

OBJECTIVES

After joining the programme, students will:

- Learn the relationship between the eating culture of Hong Kong people and sustainable fishery
- Understand the impacts of different fishing methods
- Rethink how humans should treat marine resources
- Learn what sustainable seafood is and promote the concept to other park visitors

TARGET AUDIENCE

High school students (aged 15 to 17 years)

CLASS SIZE

20 students

CLASS DURATION

2 hours

PROGRAMME FLOW

Introduction – Fish biology – Fishery problem – What consumers can do – Promote sustainable seafood to visitors – Conclusion

UNDERSTANDING THE FISHERY PROBLEM FROM DIFFERENT PERSPECTIVES

In the programme, we facilitate students understanding of the fishery problem by exploring differing perspectives on the issue by different stakeholders. We hereby aim to provide them with a broader view of the problem. High school students, equipped with analytical and critical thinking skills, can see the problem from different angles and make their own, informed choices. To make this happen, we collaborated with different parties to obtain resources, including: the governmental Agriculture, Fisheries and Conservation Department (HKSAR), two green groups (WWF Hong Kong and Hong Kong Shark Foundation), an ex-fisherman (who now is an aquarist at Ocean Park) and also the general public (our park visitors).

Students observing a real shark egg in the behind-the-scenes area.



1. Scientists

Our educators teach students basic fish biology, focussing on coral reef fish and sharks. We visit the Atoll Reef Aquarium and its behind-the-scenes area so that students can see the different (sizes of fish), relate them to their daily consumption pattern (e.g. groupers) and understand that the growth rates of most commercial fish are lower than the rates at which they are harvested.

2. Fishermen

We show students a video interview of a former fisherman named Fai who shares his point of view on the ocean and fishery in the past and today. Fai grew up on a fishing boat and had fished with his family since he was five years old. The sea was very clean back then and he enjoyed swimming in the typhoon shelter where they moored their boat. However, the sea is much dirtier now and both the size and variety of fish in Hong Kong has decreased significantly. He witnessed the over-use of hi-tech fishing equipments and non-selective fishing methods. Fai urges consumers to reject eating endangered seafood species.



3. Conservationists

Students learn about the negative impacts on the ecosystem due to over-fishing (e.g. bluefin tunas) and the use of non-selective fishing methods such as trawling (e.g. shrimps). We also emphasize the problem of shark finning by showing students an awarded documentary film called “Fin”, produced by the Hong Kong Shark Foundation (HKSF), discuss the problem with them afterwards. The documentary includes a real scene at the shark fin market and highlights the crucial role of sharks in the ecosystem and the wasteful production process of shark finning. We then introduce the students to the local seafood guide produced by WWF Hong Kong. We teach them how to use the seafood guide and highlight some “avoid” species including sharks (global), shrimps (China) and bluefin tunas (global).

WWF Seafood Guide

The WWF Seafood Guide consists of three categories, namely: “Recommended”, “Think Twice” and “Avoid”. “Recommended” species are sustainable seafood while “avoid” species are caught or farmed in an ecologically unfriendly way and fisheries are not well managed. “Think Twice” species are in-between. For more information on sustainable seafood visit www.wwf.org.hk/seafood

4. Shark fin sellers

The interviews in the documentary reveal that many sellers have a general misunderstanding about sharks. For instance, some sellers believe that sharks, like other fish, reproduce at a fast rate, while others claim that swimmers will be bitten and all “good fish” will be eaten by sharks if we don’t kill them. Nevertheless, one seller believes that humans might have caught too many sharks and that their numbers are decreasing.

5. Students

We ask students to suggest ways to solve the problem of fishery decline. The solutions they gave us included: law enforcement and stricter fishing regulations, the setting up of marine reserves, the prohibition of fishing and the consumption of endangered species. These suggestions, however, most often adversely affect fishermen’s livelihood – either directly or indirectly.

Educator acting as a fisherman representative to discuss with the students who act as government officials on the fishery problem.



Next a role-play activity follows. Our educator acts as a fisherman representative while the students act as government officials trying to convince the fisherman to follow their suggestions. Throughout the conversation with the “fisherman”, students are encouraged to think see the issue from another perspective and consider the consequences their suggestions have for the fishermen, who are the very important stakeholders of the fishery problem. The students hereby experience the conflict of interest between the government (and also green groups) and fishermen. This exercise makes students aware of the importance of involving different stakeholders in solving the fishery problem.

6. Park visitors

Having developed a better understanding the fishery problem and being encouraged to see the issue from different points of view, we now invite the students to approach park visitors and promote sustainable seafood. During this promotion, the students discover how much the general public knows (or does not know) about sustainable seafood and they also experience participating in conservation action. The impact of this vivid experience and direct involvement is very powerful indeed. Subsequently, students find it easier and are more willing to promote and apply conservation behaviour in their daily lives.

PROGRAMME EVALUATION

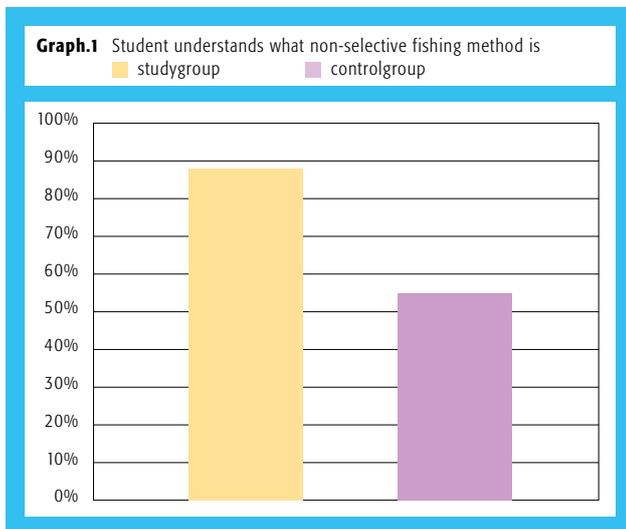
The evaluation on the programme content has been on-going in order to add in more update issues about sustainable seafood from time to time. We collected much positive feedback from the teachers. Additionally, we wanted to know if our programmes can lead to attitude and behavioural changes. A survey on student learning outcomes was conducted in January 2010 with the first group of students that joined the programme in October 2009. Our preliminary study was set up as follows:

Methodology

Short questionnaires were distributed amongst two groups of students: 20 students who did not join the programme as a control group; 19 students who joined the programme three months ago as a study group. The questionnaire included a multiple-choice question to test knowledge on the fishery problem; and a scale of one to six to test their attitude towards ocean protection and behaviour on seafood consumption. There was also an open-ended question to let them share their thoughts on sustainable seafood.

Results and Discussion

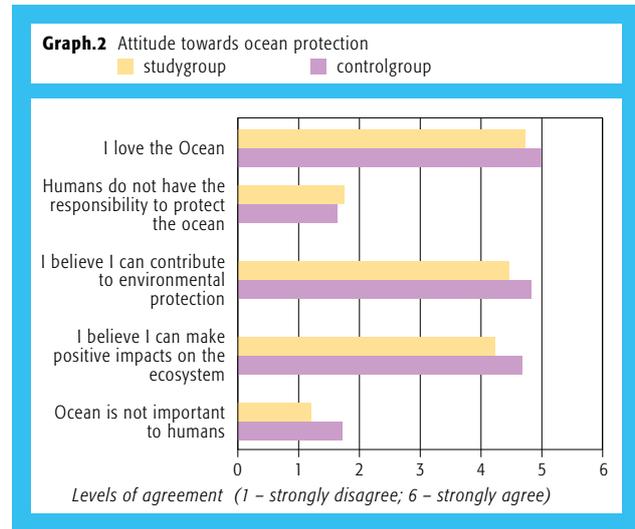
A. Knowledge gained



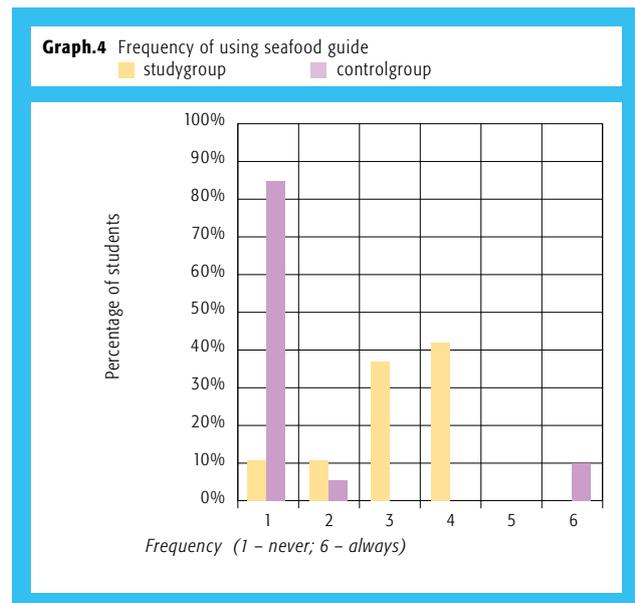
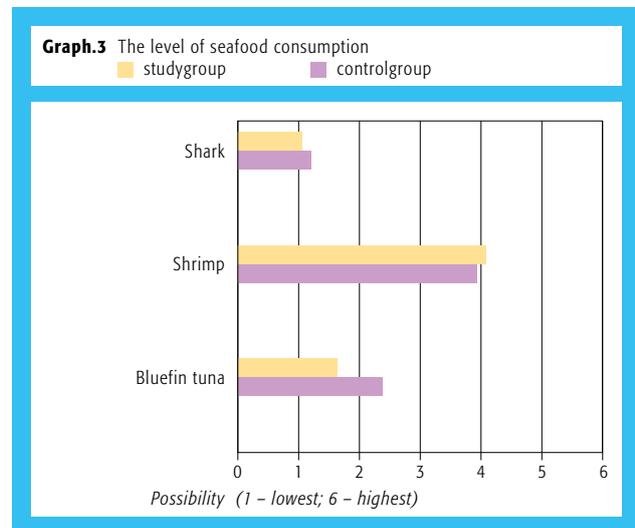
There is a significant positive difference in the result suggesting a gain in knowledge, even after three months.

B. Attitude change

The results in graph.2 show no significant change. We will need to conduct a pre- and post- study on the same group of students to find out the real attitude change after joining the programme.



C. Behavioural change



The consumption of bluefin tuna is significantly lower for the study group than the control group. The frequency of using WWF's Seafood Guide is also higher



for the study group. However, shrimp consumption is still high, while there is no significant difference between the two groups as to shark consumption. Shark fin soup and shrimps are an important part of eating culture in Hong Kong, while bluefin tuna is not (although some Japanese restaurants increasingly promote bluefin tuna). The study shows that we can lead to behaviour change after this two-hour programme, but more efforts are needed to change culture and habits.

With regard to the much higher consumption of shrimp amongst the study group in comparison to shark: shark fin is a delicacy that is not consumed frequently but shrimp is commonly used in local traditional dishes. In addition, students may already know that sharks are endangered through media coverage, but they may be unaware of the negative impact on the environment of shrimp trawling and farming.

D. Sharing thoughts on sustainable seafood

No one in the control group had input while 63% in the test group wrote feelings on sustainable seafood and showed supportive attitudes towards this issue. Below some of their responses:

- Promote sustainable seafood at school and in restaurants
- Educate the public on sustainable seafood
- Fishermen should actively be involved in fishery protection
- The government should extend the fishing moratorium period and limit the number of fishing vessels.

- Everyone is responsible for protecting the ocean and should avoid eating threatened species
- Sustainable fishing methods are very important

BE THE SOLUTION, NOT THE PROBLEM!

This programme was a good start in promoting sustainable seafood to students in Hong Kong. Through the programme, more than 230 students now know that we, people in Hong Kong, are most likely worsening the fishery problem. Fortunately, we can become part of the solution if we actively support and promote sustainable seafood. The programme provides concrete alternatives for students to choose from. We look forward to seeing their keen participation in conserving valuable ocean resources for our future.

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Zoo Education

and its Suitability for Translocation

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Modern zoos increasingly provide *in-situ* support. This can mean financial contributions that are reflected in zoo signage, thus raising public awareness. Zoos can also provide technical support: for example veterinary skills and research techniques. Teaching and learning skills can also be a component of technical support. This paper provides background on education skills that are considered appropriate for translocation, using an environmental education project in Mauritius as a case study.

Materials and Methods

Over the decades, the approach to in situ conservation has tended to shift between fortress-type conservation, including the displacement of people, and the inclusive approach of stakeholder partnership (Spinage 1998). This, more recent paradigm shift, acknowledges the need to address such conservation issues as human wildlife conflict, resource management and sustainable livelihoods. This emphasis on interface with community suggests that 21st century conservation is becoming a social science (Milner-Gulland 2002). Some skills are more easily translocated across countries and cultures than others; candling an egg or darting for anaesthesia for example. Education is more complex. It is set within the framework of social science, is culture-sensitive and in some countries may also be socio-politically sensitive. Zoo educators should proceed with caution when transferring their skills lest they are perceived to be imposing inappropriate methods and content. Working sensitively and in partnership with in-country colleagues is an essential component of successful *in-situ* conservation education. An example of a partnership of this kind is 'Learning with Nature', a conservation education initiative between Chester Zoo in the UK and the Mauritian Wildlife Foundation (MWF), the leading conservation NGO in Mauritius.

The Process and the Planning

Being given a coral island to develop for education is probably every educator's dream. Ile aux Aigrettes is such an island; a 29ha Nature Reserve 800m off the

Ile aux Aigrettes Nature Reserve.



coast of Mauritius, lying in the shelter of Mahebourg Bay and crucially inside the protection of a coral reef. The island has benefited from over 20 years of intensive habitat restoration and the reintroduction of an assemblage of endemic plants and animals. The only human inhabitants on the island are the warden and the field researchers who manage the conservation. The boat trip may be short in terms of travel time, but the journey winds back the calendar 400 years. This vision of a once-pristine Mauritius is what MWF hoped to convey to local school groups visiting the island. The 'Learning with Nature' project and the resources and training required for delivery were developed in

partnership with Chester Zoo over a three-year period. This culminated in an official launch in May 2009. The consultation process that led up to the launch is outlined below (Table 1).

The Shifting Balance of Partnership

The Mauritian school system is examination-driven with children required to pass the Certificate of Primary Education, CPE, (end of Year 6) to gain entry into secondary education. Competition to gain entry into the best secondary schools is fierce. The pressure on both primary and secondary teachers to deliver the curriculum is intense. Any thoughts of learning outside the classroom are tempered with the very real need to deliver didactic classroom learning. As such, little emphasis is placed on experiential learning and the benefits accrued from field trips. This is not to say that conservation and environmental education are excluded from the curriculum. They are there, but not in any practical sense and this is what MWF hoped to address by promoting field trips to Ile aux Aigrettes. Identifying

the institutional aims and objectives of MWF and marrying those to the demands of the school syllabus was the first step in project design. Without clear links to the curriculum and exam content, it was thought highly unlikely that the project would attract teacher, school or parent support. At the onset it was recognised that this skill had to be recruited locally from an education professional who understood the nuances and subtleties of the Mauritian education system. However skilled and experienced a zoo educator is within their own education system, this is no substitute for local insight and empathy. Mr Faizal Jeeroburkhan was appointed as educational consultant for the pilot and launch. Defining aims and objectives and building this into a realistic lesson plan was the next phase and this was done in partnership between Faizal, Maggie and Vikash (MWF Conservation Manager).

Zoo educators with experience in informal learning settings and in planning for participatory learning may have an advantage over those whose experience

Table 1 The Consultation Process.

Date	Event	Output
2006	Preliminary discussions	The project scoped
May 2007	Stakeholder Consultation (MWF Staff and Trustees/Government Ministries/ Head Teachers/ Management at other field trip sites and Chester Zoo Education Programmes Manager, Maggie Esson)	Report produced by Maggie Esson highlighting action points
March 2008	Three-day workshop (MWF Staff and Trustees) co-facilitated by Maggie and Prof Carl Jones, MWF Scientific Director	Consensus on action points agreed by MWF Management and Trustees and time-bound action plan devised
August 2008	5-day Ranger training course run	Course delivered by Presenter Team Leader Chester Zoo, Sarah Bazley Rangers acquire new skills
January 2009	Locally-based education consultant, Faizal Jeeroburkhan recruited on six-month contract	School consultation commenced and curriculum content agreed with Faizal Lesson plan produced
January – April 2009	Island work plan put into action Launch and evaluation	Resources designed and put in place for the launch. Chester Zoo joiner, Mark Roberts working with MWF Projects Co-ordinator, Frederique Koenig
May 2009		Launch completed. Monitoring and evaluation carried out by Maggie and Faizal. Data analysed by Andrew Moss, Education Research Officer, Chester Zoo



Resourcing the island included designing and planning an exhibition, signage at various key points on Le Sentier and the creation of super-immersive stopping points on the trail. Design principles; readability, word count, font size, balance of words and images, naturalistic/rustic use of mounting materials are all well understood by zoos. This is another example of zoo-based skills that can be successfully brought to an *in-situ* project. In the case of this project the Chester Zoo joiner Mark Roberts, was responsible, on-site, for much of the carpentry associated with the aesthetic framing of the interpretation.

Immersive ebony forest experience.



is essentially limited to the pedagogic genre of the classroom. The methods for delivering the lesson plan were therefore devised from zoo-based experience and this led on to resourcing the learning. Resources must take account of the environment in which they are used; climate, temperature, humidity, security, familiarity of users to materials and processes, life span and ease of replacement. This is where working in partnership has advantages. The successful delivery of a lesson plan is also dependant on the skills and confidence of the front-line educators. Many zoos run public education talks and their staff have acquired a range of presentation skills. This is a skill that lends itself to being transferred to nature reserves and trails and this is what Chester Zoo did. A training course was delivered to the Ranger team who were charged with leading the school groups on 'Le Sentier du Dodo', an upgraded nature trail around the island.

Sarah Bazley (Chester Zoo) and the Rangers on the Training Course.



Results

The launch took the form of a pilot comprising 13 tours that ran over five days with four schools participating. A total of 12 teachers and 119 students aged approximately 14 years old took part. On one of the days, a

IZE



group of VIPs including government officials was invited for an official opening. This highpoint drew the attention of the media and excellent local media coverage resulted for both MWF and Chester Zoo. The 'Learning with Nature' launch was funded through a grant from the Rufford Foundation secured through Chester Zoo.

Increasingly zoos are asked to evidence the success of their education role and monitoring and evaluation techniques are being developed in zoo education departments (WAZA 2005). This growing expertise can also be applied to field projects. Following their trip to the island, teachers agreed to visits to their schools for monitoring and evaluation purposes. Faizal and Maggie ran the evaluation together though ease of passage was undoubtedly navigated by Faizal. Semi-structured interviews were conducted with nine of the 12 teachers who had taken part in the launch.

49 Students in two schools completed Personal Meaning Maps (PMMs) and 67 students in the other two schools wrote historical accounts. The Rangers took part in a formal staff debrief session.

Teachers

From the teachers' interviews information was gathered on:

- How closely the content related to in-school teaching
- The length and duration of Le Sentier, (which was 1.7 km and 2 hrs)
- The knowledge and professionalism of the Rangers
- What the trip should cost (the pilot was free)
- Whether teachers would recommend the trip to colleagues

Students

Analysis of PMMs and written work was based on methods developed by Falk & Dierking (2000). PMMs are considered to be an inclusive approach to collecting data from students of different ages and abilities 'avoiding linguistic barriers' (Barraza 1999: 49) and for different learning styles and abilities to be accommodated. (Gardner 1995) Students were given the choice to write their historical accounts in English, French or Creole and to caption their PMMs in a similar way. The prompt for both activities was directly related to the aim of the trip, to gain an understanding of what pristine Mauritius was once like: 'Imagine you are a sailor landing on Ile aux Aigrettes 400 years ago. What was it like? Draw or write on the paper.'

Rangers

From the Rangers' debrief information was gathered on:

- The length and duration of Le Sentier
- The most and least successful of the activities
- Ideas for new or revised activities
- The efficient management of the groups

Discussion

The launch of 'Learning with Nature' appears to have been a success. The results of the evaluation will feed into the next phase of education planning. The entire island infrastructure benefited from the launch as it served to raise standards of presentation and staff from both institutions put in a huge effort to achieve this. The Ranger team worked hard to acquire the necessary skills to manage the new trail and feedback from teachers was very positive. The appointment of Faizal Jeeroburkhan as educational consultant was pivotal in designing lesson content that both satisfied curriculum needs and met the conservation goals of MWF. His efficient liaison with the schools ensured we received the support of teachers. The conservation work of MWF was showcased and Chester Zoo evidenced a successful and productive *in-situ* partnership demonstrating that



zoo education skills can be applied in different countries and cultures as long as sensitivities are taken into account.

Conclusion

It is essential to be sensitive to the cultural nuances of education systems in different countries and working in partnership with an educator with good local knowledge minimises the risk of getting it wrong!

However, there are a range of skills that zoo educators can apply with some degree of confidence in *in-situ* situations and as far as the experience from the ‘Learning with Nature’ project is concerned those skills are listed below (Table 2).

Table 2 Zoo educator skills that can be implemented into *in-situ* projects.

Skills	Description
Strategic planning	Defining project aims and objectives
Planning for participatory learning	Devising sustainable resources
Writing lesson plans	SMART objectives
Staff training	Presentation skills and managing groups
Interpretation	Design, writing, readability and construction
Evaluation	Monitoring and evaluation techniques

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The Learning Impact

of Animals and Animal Artifacts

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In today's litigious society, complaints filed by animal rights activists and demands placed on schools through the increased accountability of high-stakes testing mandate examination of instructional strategies that use live animals in the classroom. This study was designed to examine how the utilization of animals and animal artifacts as instructional tools in selected fourth-grade classroom instruction influences learning.

This research examined the cognitive impact of various delivery methods for a life cycle lesson plan delivered to fourth-grade students. Four groups included one led by a teacher and three led by an Education Curator with either live animals only, animal artifacts only, or live animals and animal artifacts. Students participated in pre- and post-tests and all four groups showed significant increase.

Introduction

Many zoos use animals and animal artifacts in their education programs. However, little research supports live animal or animal artifact use as an educational tool. The researcher hypothesized that students receiving instruction with contact animals and animal artifacts together would result in higher recall achievement than students receiving instruction without contact animals and animal artifacts.

Classrooms across the nation house a variety of animals, but the cognitive impact of those animals as instructional tools is not well-researched (Rud and Beck 2000; Sherwood et al. 1989). Animals have a beneficial influence on student feelings and attitudes. Stories students share about pets at home provide a reason for not allowing animals into the classroom, as suggested by Rud and Beck (ibid.). The use of visual aids, including props like animal specimens, is important when they will make an interpretive presentation more memorable (Ham 1992). The question is whether live animals have a greater visual imagery or novelty impact on recall than do pictures. Knapp and Benton (2005) reported that being in contact with live animals or being able to touch items, such as antlers, did increase participant recall and recognition. They reported touching as a novel experience that added to the cognitive impact of the presentation.

Zoo educators typically refer to themselves as interpreters.

“Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource”.

(National Association for Interpretation, n.d.)

Animal artifacts

Animal artefacts are defined as objects created on the part of the animal that uses or modifies available material(s). Antlers, webs, cocoons, are examples of animal artifacts.



Photo © Jantjin van den Heuvel

Sherwood et al. (1989) examined whether utilizing a live animal or an animal artifact was more effective in improving recall. This study showed increased learning of both themed programs, but the long-term retention was greater, $p < .001$, for the program utilizing a live animal. These 45-minute programs were presented to students from one public school district visiting Mystic Marinelife Aquarium. The students were presented the programs outside their school, and the study did not include a control group.

In an effort to examine the impact of live animals in the students' regular learning environment, their classroom, Yerke and Burns (1993) presented a program with live animals in schools. This research showed no significant difference between pre- and post-tests in relation to cognition. It included no control group and was not part of the normal curriculum.

Based on the lack of evidence for the use of visual aids in promoting cognitive growth, the following hypothesis was formed:

Students receiving instruction with visual aids, live animals and artifacts, will have higher post-test scores than all other instructional groups.

Methodology

Participants

To investigate the impact of live animals and animal artifacts on learning (measured by unit pre and post tests data), the researcher developed a partnership with seven elementary schools from the Salina School District and St. Mary's School at Salina, Kansas. The schools had the potential to receive a free program/lesson for all classes in their building. The partnership identified six fourth-grade classes per test group.

Design

Each of the four test groups consisted of two randomly assigned schools. The structures below describe the test groups:

1. The lesson presented with supplies, such as photos, provided by the researcher.
2. The lesson presented by the researcher with only animal artifacts.
3. The lesson presented by the researcher with only live animals.
4. The lesson presented by the researcher with both live animals and animal artifacts.

Procedure

The lesson for each test group covered identical information. Regular teachers provided the instruction for the control group. The researcher provided the instruction for all other groups. The researcher is a zoo educator and has no experience and limited training as a teacher. Teachers in the control group were experienced and licensed. Lessons in both groups were limited to 45-minutes. Information packets were provided with written instructions on administering the pre- and post-tests.

The pre-test was administered prior to lesson presentation. The post-test was administered after instruction. The researcher collected and scored all tests. Teachers were instructed not to answer students' questions regarding the tests and were told to encourage students to "do the best they can." Teachers were told not to assist students who found unfamiliar terms in the pre-test.

Lesson plans developed by the researcher were provided to teachers in the control group. The control group teachers were instructed to present a 45-minute lesson. If students had questions that remained unanswered when the 45-minute period ended, teachers were instructed to refrain from answering questions until after the post-test was given. In addition to the

Table 1 Descriptive Statistics by Lesson Type.

Lesson Group	N	Means (Std.Dev.)	
		Pre-test	Posttest
Teacher Led	111	12.0360(2.45663)	14.9189(2.58012)
Artifact Only	135	11.7407(3.35680)	14.4889(3.22968)
Live Animals Only	93	11.5806(3.19416)	14.9032(3.20008)
Artifacts and Animals	115	11.4348(2.75340)	13.8435(3.02502)

Note: Maximum score = 20.

Table 2 Analysis of Variance for Effects of Lesson Artifacts on Cognitive Growth.

Source	df	F	η	p
Lesson	3	3.065	.02	.028
Within group error	450	(9.145)		

Note: Value enclosed in parentheses represents mean square error.

instructions for the lesson, teachers were provided copies of the pictures to be utilized during the lesson plan. No handouts were given to students, nor did they have homework for the lesson plan.

All lessons were presented to the schools within a 10-week period. Due to the logistical obstacles of working with multiple schools, the lessons were not presented at the same time of day. For example, some schools received the lesson plan before lunch and some received it after lunch. The lessons were presented in the fall to ensure the students had not already received a lesson on life cycles prior to this research project.

Instrument

The researcher developed multiple-choice pre- and post-tests. Each test included 20 questions that were aligned with the Kansas State Science Standards. The lesson objectives directly related to state science testable benchmarks. Two teachers reviewed the lesson plans and tests. Both teachers agreed that the lesson plans and test were aligned with all objectives. They also concluded that the tests reading difficulty was appropriate for fourth grade students.

Analysis and Results

Pre- and post-test scores were collected from 24 classrooms with 454 students (see Table 1). Pre-test

scores showed no differences based on group: $F(3,450) = 0.88, p = 4.74$. Only one type of lesson was administered at each school to control for novelty effects; the school variable could not be controlled. Post-test scores were analyzed using a one-way ANOVA to determine the impact of visual aids on learning. Results showed a significant difference between groups receiving different types of instruction: $F(3,450) = 3.07, p = .03$, partial eta squared at .20 (see Table 2). Based on Tukey post-hoc, the only difference was that students receiving teacher-led instruction had higher post-test scores than did students receiving instruction that included both live animals and artifacts: $p = .039$.

Conclusion

Although studies have examined the impact of animals and animal artifacts on students, few have focused on the effects those tools have on learning in comparison to traditional teacher-led lesson plans. This research subjected students to one of four treatments. The results did not support the researcher's hypothesis that fourth-grade students receiving instruction with contact animals and animal artifacts together would achieve higher results than fourth-grade students receiving instruction without contact animals experienced. The results were not definitive and should not be used solely to make curriculum/lesson plan decisions at this point.



Photo © Archive Rotterdam Zoo

The study did not control for or take into consideration the socio-economic status of the students. In addition, that factor could not be controlled for statistically. The two schools that were randomly selected for the group receiving the lesson with live animals and animal artifacts had a student body with over 60% of the students from economically disadvantaged families. In comparison, only one of the two schools whose regular classroom teachers taught the lesson plan had over 60% of its student body from economically disadvantaged families, and the other school had well over 60% of its student body from families that were not economically disadvantaged.

The four schools in the study showed achievement differences on state standardized tests in reading and math, in addition to their economic differences. Science standardized testing scores were not available. Both schools in the test group that showed significantly better post-test scores in this study also scored higher than the other two schools in reading and math on the state standardized tests in third, fourth, and fifth grades. In addition to under-performing on the state standardized tests when compared to the group that received the lesson from the classroom teacher, the two schools that received lessons with live animals and artifacts also scored lower than state averages in fourth-grade reading and mathematics.

Another factor that may have influenced the results of this study was the time limitations applied to each presentation of the lesson. The teachers and the informal educator were instructed to allow no longer than 45 minutes for the lesson. The group that incorporated both live animals and animal artifacts had twice as many visual aids as any other group. The additional visual aids required additional time, which reduced the time available for instruction in comparison to the other classrooms in the study. Thus, the informal educator was forced to change the delivery of the information to a much faster pace, which might have affected learning.

The study did not attempt to control the comparative quality of the instructional skills of the teachers and researcher involved in the study. The researcher, as a zoo curator, had content knowledge but did not have the pedagogical training of the control group teachers.

Finally, life cycles are more difficult to demonstrate with live animals and animal artifacts in comparison to pictures and videos. A significant difference might occur when utilizing live animals and animal artifacts in a lesson focused on comparing and contrasting animal structures and functions.

Further studies must be conducted before any reliable conclusions can be drawn when making decisions about curriculum. Additional studies might examine the effect of grade level on the efficacy of utilizing live animals and/or animal artifacts as visual aids when informal educators present lessons. Studies that controlled the variable of teacher instructional skill would be beneficial.

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The Power of Presentations

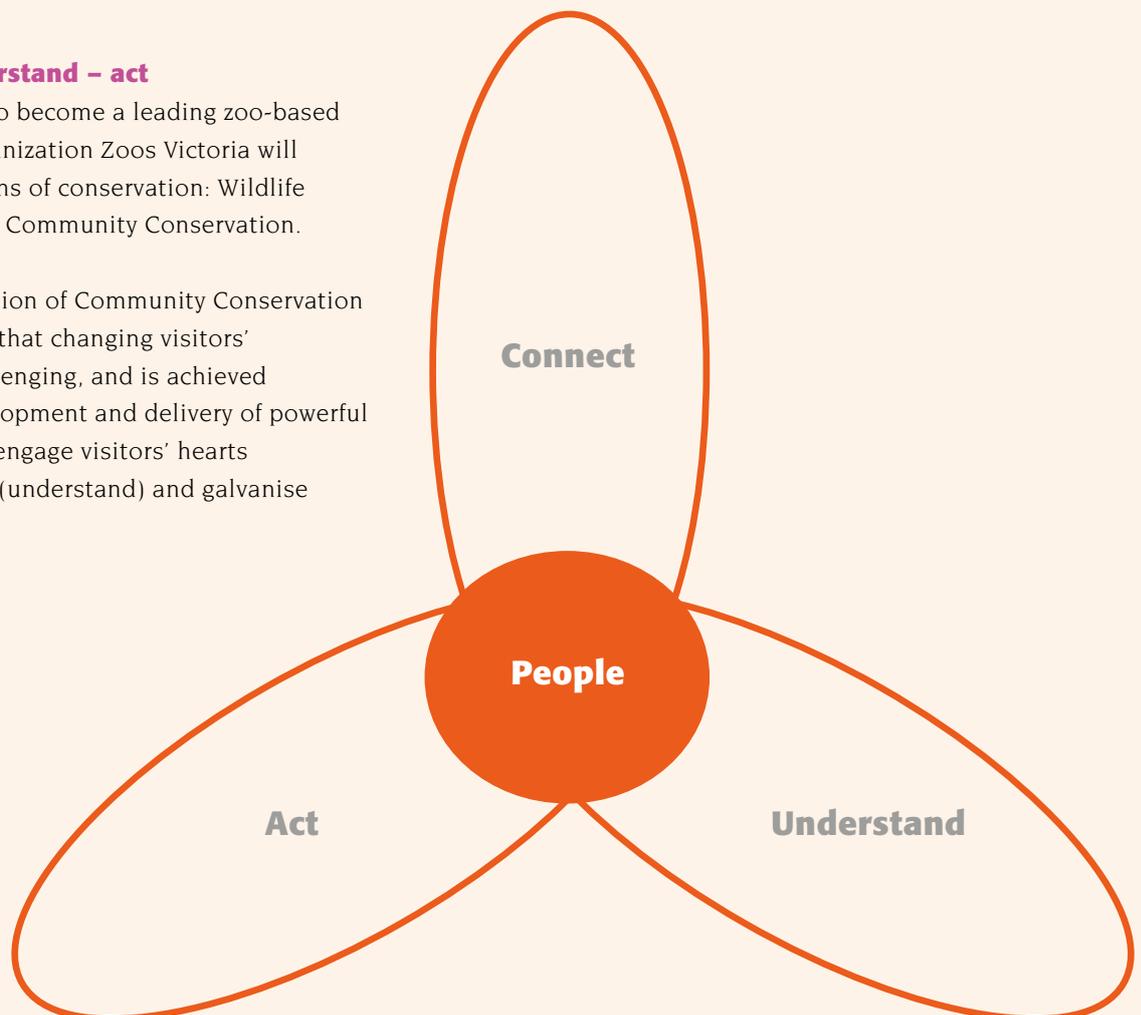
by **Scott Killeen** GENERAL MANAGER VISITOR EXPERIENCES | MELBOURNE ZOO | ZOOS VICTORIA | AUSTRALIA

Think back to a presentation you enjoyed. What worked? Did it have an intriguing beginning, a cohesive story or a captivating ending? Perhaps the presenter had clever ways of engaging you so that you felt like a participant rather than a spectator? These are all the ingredients in a new Presentation Toolkit developed by Zoos Victoria to create powerful wildlife experiences in its endeavour to becoming a leading zoo-based conservation organisation.

Connect – understand – act

In its aspiration to become a leading zoo-based conservation organization Zoos Victoria will pursue two streams of conservation: Wildlife Conservation and Community Conservation.

Central to the notion of Community Conservation is the realisation that changing visitors' behaviour is challenging, and is achieved through the development and delivery of powerful experiences that engage visitors' hearts (connect), minds (understand) and galvanise action (act).



At the heart of this connect – understand – act journey are the people that visit and the people that work at the Zoo. The interaction between visitors and staff, including volunteers, plays a vital role in taking visitors on this journey towards making a difference for wildlife and wild places.

Recognising the power of face to face interpretation to engage visitors, we set out to equip our presenters with tools to help them create powerful and memorable experiences that would build emotional connections with wildlife, help visitors understand issues facing wildlife and provide visitors with the opportunity to take conservation action.

The first step was to review existing presentations to identify where staff could be best supported.

The review

With the assistance of John Pastorelli from Ochre Learning, presentations across Zoos Victoria’s three properties – Melbourne Zoo, Werribee Open Range Zoo and Healesville Sanctuary – were reviewed. This process revealed that:

- Presenters were doing a good job at delivering face-to-face experiences.
- Staff strengths varied. Some delivered strong introductions for example, whilst others would deliver more memorable conclusions.
- Some staff often lacked the confidence or the strategies to try new presentation approaches.
- Many staff had never had the opportunity for formal training in presentations.
- There was a lack of consistency in how presentations were being delivered and in the experiences visitors were receiving.

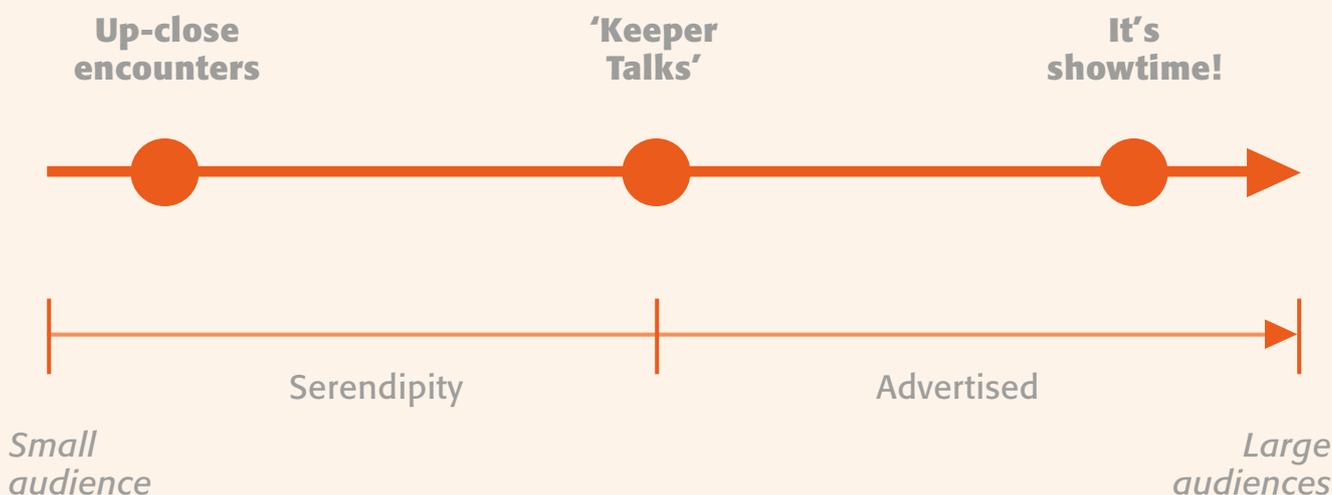
- Presenters were delivering a wide range of experiences including intimate, chance encounters and ‘casual conversations’ 15 minute ‘Keeper Talks’, hour long Behind the Scene and Safari Bus tours, presentations for large audiences and overnight camps. This variety of style, audience capacity and duration is depicted at the bottom of this page.

In essence, staff were doing a great job delivering a wide variety of presentations. Most staff included key elements of a good presentation some of the time but no one was including all the key elements all of the time. Many presenters relied on instinct rather than any established consistent framework to help ensure their presentation’s effectiveness.

The challenge

We realized that we needed a practical, easy and fun to use presentation framework that would:

- Apply across all three properties.
- Help with a range of experiences from brief encounters and longer ‘talks’ through to hour-long safari bus tours and overnight camps.
- Work with different sized audiences.
- Help staff target presentations to build emotional connections, enhance understanding or facilitate action or a combination, in line with our zoo-based conservation strategy.
- Acknowledge and build on staff’s experience and expertise.
- Provide a framework to enable a consistent approach to presentations.



Toolkit: all the tools you need to build great presentations



The solution – Presentation Toolkit

To make building presentations easier, presenters have been equipped with their own Presentation Toolkit.

The toolkit's DIY Guide provides a simple presentation framework that removes the 'guess work' out of building presentations. The DIY Guide is accompanied by a series of tool cards created to help presenters build purpose-built 'connect', 'understand' and 'act' presentations.

DIY Guide

The DIY Guide outlines a presentation framework developed collaboratively by Zoos Victoria and Ochre Learning. The framework describes three 'building blocks' of a presentation, the things you say and do before and after the story is shared (POWER), and the story itself (Hook, Line and Sinker). It encapsulates all elements of preparing, delivering and evaluating a presentation rather than simply focusing on the 'talk' or 'story' part of the presentation.

POWER

We describe the building blocks either side of your story as the 'foundation' for your presentation. It provides a 'powerful' platform to build your presentation. Laying a strong foundation is just as important as having a strong story. *POWER* creates a simple checklist to help plan and deliver the things you say and do before and after your story rather than relying on intuition alone.

Prepare • prepare yourself, space and your resources

Overview • build rapport with your audience

Wrap-up • bring your presentation to a close

Evaluate • continue to improve what you do

Refresh • try something new!

Hook, Line and Sinker

The story you'll tell

P O

BEFORE your story

W E R

AFTER your story

Building blocks of a presentation

Hook, Line and Sinker

This analogy, based on the saying 'got you hook, line and sinker,' helps you craft a story with a memorable beginning, middle and end.

Hook • How will you capture your audience's attention from the very beginning? Hooks can include a question, an amazing fact or a personal anecdote. Hooks are also used throughout a presentation to focus the audience's attention on your key points.

Example...

"Who in the audience has a mobile phone? Please hold it up. Now take a look at your phone. You may simply see a mobile phone, but I see the secret to helping save gorillas in the wild. Let me tell you more."

Line • This is the thread that ties your presentation together. It includes your theme or key message and your three to five main points used to illustrate your theme.

Example...

Theme: Helping save gorillas in the wild is as easy as recycling your old mobile phone.

Key points:

- The Zoo's gorillas
- Gorillas' rely on habitat
- We also rely on gorillas' habitat
- Coltan used in some mobile phones is mined in gorilla habitat
- Recycling old mobile phones reduces demand for coltan, helping save gorillas

Sinker • How will you help ensure the key message sticks? A great 'sinker' closes the loop on the presentation. For example, if a question was asked at the start of the presentation then a sinker will answer that question. Regardless of the style, a strong sinker will be concise, one or two sentences in length and aim to stir emotions, provoke thought or facilitate action.

Example...

"So next time your mobile phone rings, remember gorillas are calling on you!"



Tool cards

The toolkit also contains a series of 'tool cards' divided into five sections; Connect, Understand, and Act and Engage.

The tool cards have a relaxed and quirky graphic style created by designer Tania Enor, and helps make them easy and enjoyable to use. Each tool card has a title, a definition to explain the tool and an example of how it can be applied being applied.

Connect • These tools will help build emotional connections between the audience and your subject.



Get personal



Revealing personal details transforms an 'animal' into an 'individual'. "Suma the orang-utan really enjoys painting. She will often mix red and blue paints to make her favourite colour purple."



Close encounter



An animal encounter whether contact, feeding or a close-up view, promotes wonder and connects visitors to animals. "Hold your apple out in front of you, nice and still and the elephant will take it from you."

Understand • These tools help build presentations that aim to increase the audience's awareness of an animal or related issue.



Tell a story



A story can help present ideas and information in a way that's easier to understand. "The rarest animal in the whole world is a giant tortoise named Lonesome George. George is the last surviving Pinla Island Galapagos Tortoise. His story demonstrates the threats facing all species of giant tortoises."



Get active



Physical activity is fun and helps put learning into action. "Heard the expression 'eyes in the back of your head?' Well an owl can literally turn its head to look behind. How far can you turn your head? Give it a try!"

Act • Effective behaviour change targets ONE behaviour at a time. Always start by working out your one target behaviour.



Incentive



Incentives enhance people's motivation to act. When trying to influence people to make sustainable timber choices, Melbourne Zoo provided discount vouchers to a furniture store that uses sustainable timber.

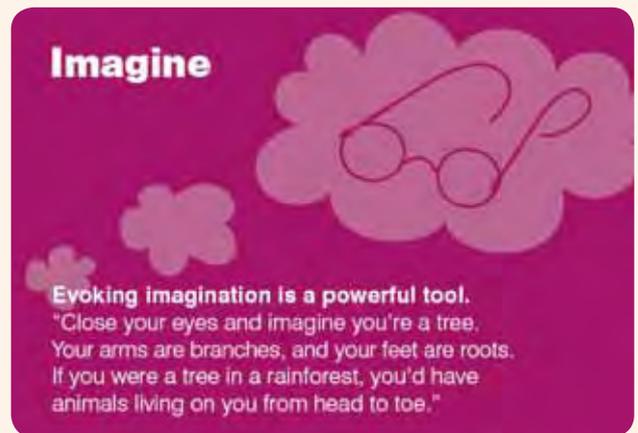


Prompts



Prompts remind people to act sustainably. Wallet-sized sustainable seafood cards remind people to purchase sustainable seafood when at the supermarket.

Engage • Think about a presentation you enjoyed... how did the presenter engage you?



IZE

40 tools have been developed to date. New examples of tools will be captured on-line to create a growing resource. The format of the toolkit means that new tool cards can be easily added.

A sustainability note

Environmental sustainability underpinned both the development of the content of the toolkits as well as the toolkit's physical form. Waterless printing process using 100% renewable energy and soy ink along with recycled paper are used in the production of the DIY Guide and tool cards. The toolkit packaging itself is made in Australia using 100% recycled post-consumer waste and is 100% recyclable.

Conclusion

Zoos Victoria aspires to become a leading zoo-based organization. In recognizing that the presentations we deliver are a key ingredient in achieving this goal, the Presentation Toolkit was developed to empower staff to deliver powerful and memorable experiences that would take visitors on a journey of connect – understand – act and help visitors make a difference for wildlife and wild places. The simple, practical and easy to use presentation toolkit is now being used by over 200 presentation staff across Zoos Victoria including animal keepers, horticulture staff, educators, safari bus guides and other dedicated presentation staff. The following quotes provide a reflection of how the framework has worked for staff to date:

"I got a headache ... in a good way ... from all the hooks I've been using!"

"I now have more confidence to develop and deliver presentations."

"My presentations now feel stronger in that they have a point whereas before they were rambling bits of information."

Regardless of whether the presenter is a new or an experienced presenter, all staff have benefited from some aspect of the framework and toolkit. For some it is the simple POWER checklist that helps to ensure all aspects are covered whilst for others it is the Hook, Line and Sinker that has helped to redefine the 'purpose' of the beginning, middle and end of the stories they share with visitors.

The presentation framework has also received interest from zoos and other organisations around Australia and overseas. Taronga Conservation Society in Australia and Wellington Zoo in New Zealand have also adopted the framework. It has been presented at a number of national forums and recently at the international conference of National Association of Interpreters, a USA-based organisation.

What started as a simple solution for one organisation is promising to help others to develop and deliver powerful presentations.

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ACKNOWLEDGEMENTS REFERENCES

The Presentation Toolkit could not have been developed without the collaboration of Zoos Victoria staff and John Pastorelli from Ochre Learning. Zoos Victoria thanks John for his expertise and insight into face to face interpretation.

The toolkit has also been inspired by Sam Ham, Douglas McKenzie-Mohr and John Pastorelli (see references).

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Let's go to the zoo!

Visitors' social expectations of a trip to the zoo

by **Victor S. Yocco** (RESEARCH ASSOCIATE) and **Dr. Joe E. Heimlich** (SENIOR RESEARCH ASSOCIATE/DIRECTOR) INSTITUTE FOR LEARNING INNOVATION, **Prof. Dr. Chris Myers** DEPARTMENT OF ZOOLOGY | MIAMI UNIVERSITY, and **S. David Jenike** VICE PRESIDENT AND CHIEF OPERATIONS OFFICER | CINCINNATI ZOO AND BOTANICAL GARDEN | USA

Data were collected from zoo visitors regarding their interests and social expectations of a zoo visit and the expectations they feel others they are visiting with have. Findings suggest that visitors rate themselves as having a higher level of interest for some activities such as spending time with family. Social expectations that visitors have include interacting with others they are visiting with, learning about animals, and watching animals.



Introduction

It has been noted that education is a prominent theme in US zoo mission statements, and that zoos are in a unique position to provide environmental education to a large number of visitors (Patrick et al. 2007). It is critical for zoos to understand their visitors and provide them with unique and engaging experiences designed to further the education of visitors.

Wild Research – A whole zoo exhibit and inquiry program is a National Science Foundation funded collaboration between Project Dragonfly out of Miami University, the Cincinnati Zoo and Botanical Garden (CZBG), the Institute for Learning Innovation and a consortium of zoos and aquariums nationwide (Myers et al. 2007; Myers et al. 2009). A major premise of *Wild Research* is to build on the social interactions that take place in a zoo

to improve visitor learning and engagement. Visitors participate in inquiry: make predictions, gather data, and compare results all within the very social context of observing animals at different exhibits surrounded by other zoo visitors engaging in similar activities.

There is a small but growing body of literature on the motivation of visitors to free choice learning institutions such as zoos, aquariums, and science centers. Generally speaking, education and recreation are two of the biggest motivations bringing visitors to a zoo (Andereck and Caldwell 1994; Morgan and Hodgkinson 1999). Falk and colleagues have identified a typology of five visitor temporal “identity-related motivations,” suggesting that zoos and aquariums need to offer programming that will appeal to multiple types of visitor motivations (Falk 2006; Falk et al. 2008). Falk and colleagues put forth that these “identity-related motivations” have a direct effect on the learning outcomes that visitors experience from a visit to the zoo. Addressing the motivating factors that brought visitors to the zoo is critical to achieve the goals of conservation education programming. However for Wild Research and similar programming containing elements of social interaction, it is equally critical to determine the type and level of social expectations that zoo visitors have as well. The purpose of the study reported on in this article was to collect data on site at CZBG to inform the design team of Wild Research on the social expectations that zoo visitors have. This is useful to other zoos hoping to incorporate the social experiences that visitors wish to have into their educational offerings.

Method

In order to measure the social expectations of CZBG visitors, researchers from the Institute for Learning Innovation created a questionnaire listing 18 different activities that are possible to do while visiting CZBG (see table 1). Participants were also asked to rate on a seven point ranking scale how strongly they felt those whom they were visiting with were interested in these same activities. The final portion of the instrument asked participants to rate how strongly they were likely to engage in 12 types of interactions at zoos (see table 2). One hundred three visitors to CZBG participated in the study. All participants were age 18 years and older and were in groups of two or more when they were approached.

Results

The activity scale had an overall scale reliability alpha of .930. Nunnally (1978) recommends a scale reliability of at least .700 for a scale to be used in social science research. Table one (on page 38) shows how respondents overall were motivated both for themselves and what they felt the level of interest was for those whom they were visiting the zoo with on this particular visit. Seeing lots of animals, spending time with family, and spending time outdoors were all very considered activities both the individuals and others would have a high interest in doing while at CZBG. Riding the train, feeding the giraffes, having lunch/snack in the zoo, and seeing animal shows were all activities the respondents felt were stronger motivations for others in their social group.





Table 1 Mean and standard deviation for interests during zoo visit for self and for others.

FOR ME:		Item	FOR OTHERS:	
Mean	Std. Dev.		Mean	Std. Dev.
6.47	1.09	Spend time with family	6.24	1.32
6.31	1.27	See lots of animals	6.26	1.32
6.31	1.11	Spend time outdoors	6.15	1.17
6.07	1.17	Walk outdoors	5.74	1.53
5.95	1.85	Educational experience for my child	5.51	1.94
5.78	1.46	Share something I like with others	5.46	1.61
5.57	1.56	Educational experience for me	5.36	1.69
5.55	1.40	See a specific animal	5.80	1.38
5.52	1.49	To "get away" for a while	5.28	1.63
5.51	1.78	Spend time with friends	5.42	1.88
4.93	1.64	Enjoy the gardens	4.29	1.85
4.62	1.84	Feed the giraffes	5.10	1.87
4.31	1.91	See the animal show(s)	4.51	2.05
4.26	1.89	Hear a keeper talk	4.02	1.99
3.87	2.12	Ride the train	4.74	2.20
3.62	1.99	Have lunch/snack in the zoo	4.25	2.08
2.53	1.72	Go to the gift shop	3.20	2.05
2.10	1.61	See a movie	2.52	1.75

Table 2 Mean, and standard deviation for how visitors would like to interact at zoos.

	Mean	Std. Dev.
Doing activities with my family or friends	6.327	1.02
Learning a new thing about different animals	6.129	1.11
Sitting and watching animals	6.109	1.13
Providing an educational experience for my child	5.911	1.76
Just talking with my family or friends	5.802	1.35
Getting family or friends involved in something new	5.713	1.28
Hearing what my family or friends are learning about animals	5.584	1.43
Watching others do things/activities	5.109	1.60
Trying new things with others	4.950	1.65
Reading signs to myself	4.750	1.89
Talking with people I meet	4.455	1.64
Reading signs to others	4.149	1.85

Standard deviations were generally similar with a couple of exceptions. Riding the train both for the individual and for others had slightly higher deviations than expected, which suggest there is a bi-modality in the response pattern; some individuals have a high interest in this activity, while some have very little interest in this activity. This is also the case for having lunch/snack in the zoo and going to the gift shop.

There were several significant differences between what individuals expect from a visit and what they think those they are with expect. Participants rated their interest significantly higher ($p < .05$) than those whom they were visiting with, for the items spend time with family, walk outdoors, educational experience for my child, share something I like with others, and enjoy the gardens. Participants rated their interest significantly lower ($p < .05$) than those whom they were visiting with for the items feed the giraffes, ride the train, go to the gift shop, and see a movie.

Participants were also asked to consider the ways they like to interact while at the zoo. Consistent with the data reported above, doing things with family or friends and watching (and learning) about animals score most strongly. As shown in table two, all activities had overall positive scores, although reading signs to others was close to neutral but did have a larger deviation which could reflect ages of children in intergenerational groups.

Discussion

Participants report a strong desire to spend time with their family walking outdoors, seeing lots of animals while having an educational experience. This bodes well for programming such as Wild Research that in effect will attempt to capitalize off of these interests that are already expressed at zoos. These findings support those by Tomas et al. (2003) who found that family togetherness was the most important benefit listed by participants in their study of benefits visitors find in zoos. Recommendations stemming from this finding would be to ensure that the programming offered by zoos facilitates visitors participating in these family time enhancing activities. Allowing visitors to engage in activities as a family, which keep them moving and outdoors would align with the higher ranked social expectations that visitors had.

Conversely, participants have much less of a desire to ride the train, have lunch, visit the gift shop, and see a movie during their zoo visit. Programming around these activities may be less likely to be taken advantage of by visitors who do not view these as a critical part of their zoo visit. It is notable that participants rated these four lower ranked activities significantly higher for others in their group. Given that participants were over the age of 18, but often in groups containing children, this suggests that there may be a parent/child dichotomy when it comes to activities that visitors would like to engage in while at the zoo. This is also supported by the significant difference in rating that participants

Play with plants.



Display case with hidden clues and trail information.



give to “educational experiences for my children” and “to see the gardens.” Adults are assuming that the children they are with have less of a desire to have educational experience and less of a desire to view the gardens. The activities which participants rated their interest significantly higher than those they are with could be termed as “my goals” from the viewpoint of the visitor, while the activities which participants rated those they were visiting with as having higher interest could be termed “expectations of others.”

In regards to how visitors would like to interact at the zoo, visitors rated reading signs by their self and to others in the bottom four activities. This supports findings reported by other researchers (Ross and Lukas 2005; Tunnicliffe and Scheersoi 2009) that visitors spend significantly more time looking at animals than signage. Trying new things with others and talking with people I meet were also rated in the bottom four activities. This suggests that visitors are looking for a more predictable experience with those whom they are visiting with, not new experiences that they engage in with those they have just met during the visit.

Recommendations for Wild Research or other similar programming, based on the data on how visitors would like to interact, would be for programming to allow interaction between family members visiting the zoo that teaches them new things about the animals, while allowing them to observe the animals. In this regard, Wild Research has positioned itself to take advantage

of these visitor characteristics, creating research stations at a number of different exhibits which allow for visitors to pose and answer questions as groups; which are then answered through observation of the animals featured in the exhibit.

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All photos © Chris Myers

What Displays Work for Children?

by Louise Matschke CURRICULUM SPECIALIST | JOHANNESBURG ZOO | SOUTH AFRICA



Ille aux Aigrettes Nature Reserve.

Zoos and aquaria appeal mainly to the visitors' need for entertainment and recreation according to Packer and Ballantyne (2002). In most cases, zoo educators are tasked with meeting these needs whilst effectively conveying zoological facts. Moreover, signs and posters are used to convey the information that we deem necessary. But what if your audience is under the age of nine years old, they are only learning to read and English is not their home language?

The Johannesburg Zoo education staff recently took on this challenge when the Farmyard exhibit was redeveloped. This article will take you through the development, implementation and utilisation of the displays for Badger Glen Farm.

Early Childhood Development (ECD)

Early Childhood Development (ECD) is a strong focal point with the United Nations and it advocates that children between the ages of three and nine years old need to be developed in a social, emotional and cognitive manner. The main concern of any ECD programme is the holistic development of a child and an institutional setting for this is of little importance (UNESCO 2002). The South African government is placing necessary focus on this as ECD is fundamental in a child's development. The limited literacy and numeracy skills at this stage have a direct impact on a child's success in their schooling career.

In the past, the Farmyard has always attracted this age group, so it seemed fitting that Badger Glen Farm be the Early Childhood Development (ECD) Centre of the Johannesburg Zoo.

Developing the Farmyard

Badger Glen Farm is an outstanding example of the keeper and education staff working together to develop an experience on the farmyard that will draw visitors and engage them through interactive educational elements. Although the education staff were not involved in the structural planning, we were involved in every other aspect. Every part of the development – be it the animal collection plan or the signage – had one guiding principle: "It has got to be fun but relevant and encourage interaction".

Through literature studies, informal discussions and focus group engagement with ECD specialists, interpretation specialist, animal breeders, animal and education staff (both internal and external); the animal collection plan was implemented and temporary displays were developed.

The animal collection plan consisted of special domestic animal breeds including a conservation project of Pedi and Zulu nguni sheep. The decision to include special breeds has attracted visitors to the farmyard as they are amazed by the size of the Buff Orpington Chicken, they have a good laugh at the



Crested Duck with the ball of feathers on its head or they marvel at the size of Vietnamese Pot Bellied Pigs' dragging tummies.

Adding educational elements

The temporary displays were trialled with various family and school groups. As can be seen from the example of a temporary sign, the format is simplistic with easily recognizable graphics and wording that is easy to read. The adults found the information on the posters interesting and the school teachers requested copies of the posters for the classroom. From this and further discussions with parents and teachers of young children, the displays were adapted and developed into what they are today.

The final products include ten A0-sized posters, four murals, a chalkboard, a playground, animal information signage, grooming brushes, interactive block displays and the animals. The interpretative displays were developed with levels of progression in mind. As the child develops its literacy level, there are different displays to accommodate them. This is better known as "scaffolding". All the displays included the same graphics so that the children could easily recognise the different animals.

Posters

Six of the ten A0 posters provide information about farmyard animals that is relevant to the curriculum that young children are taught in pre- and primary school. It included baby names of animals, male and female names, collective nouns, diets of farm animals, animal sounds and a "Did you know?" poster.

Two of the A0 posters are process diagram posters, which illustrate a simplified process of getting farm produce into the form we most enjoy... an egg sandwich or a glass of chocolate milk. It shows how the milk comes from the cow to your glass of chocolate milk or where your egg sandwich comes from. According to the literature, mind mapping or process flows such as these, helps to develop conceptual understanding and also develops creativity within children.

The last two A0 posters are interactive posters with added features that allow for a sensory experience. The grooming poster informs the visitors about the grooming process for particularly equines and which brushes are used. The different brushes have been added to the poster so that children and adults can see and feel the difference in the equipment. The other interactive poster, which happens to be my



favourite, is all about tongues! My earliest memory of the Zoo Farmyard was the cow that used to grab food from you using its long, rough tongue. The poster starts off with a tongue twister about tongues. Below that are pictures of an animal and a little box. By sticking your finger into the little box you can feel what a cat's tongue feels like, or a cow, dog, horse, duck and even a frog. Many children were cautious of this to start off but really enjoyed it, going back again and again. Through my observations of the groups and individual interviews with the children and parents, I found that children enjoyed and learnt the most from these two posters and that the children were able to interact without adults present but when adults are present there is even more interaction between them.

Why did we use this kind of format for the poster? The answer is simple, it is different! Visual text instead of written text attracts a different audience who normally would ignore a text laden poster. It also simplifies a complex process. From my observations, all of the parents engaged with their children in conversations about these posters.

Mural displays

The foundation of all learning lies in numeracy and literacy, which is a strong feature in the mural displays.



The "Day on the farm" mural depicts the day in a life of a farmer, showing his activities from the time he rises to the time he goes to sleep. Hidden within each picture is the digital time format and the children can use the analogue clock in the centre of the mural to determine the time through conversion which is a basic numeracy requirement. Two murals are related to height which allows visitors to measure themselves against different animal sizes. The one mural has three types of height measurement; hands, feet and metres, allowing for further numeracy conversions or comparison. The "Song Wall", is a sing-along about farm animal sounds. The idea originated from observing



young children walking around the zoo as they love to sing, particularly the nursery school children and they seem to know a song or a rhyme about every animal.

Animal information signage and labels

With the structural design of the farmyard, every aspect of the farmyard is on public view. As a result every part of the farmyard was labelled. The stables and night rooms are labelled and the animals that live in them are named. The tools and tack in the shed are labelled as is the food and fodder in the feed room. Through labelling everything with easy to read large font, our younger visitors can easily read the words for themselves and develop their literacy skills.

The animal information signage for the Farmyard was simplified for our visitors. Usually, the animals' signs are filled with information but for the Farmyard only the necessary text was included, simple language was used and the font was made larger which makes it easier for younger visitors to read.

Playful features

There are a number of just plain fun elements within the Farmyard. Most would say that they are not very educational as the children are just playing. Playing is behaviour displayed in animals, especially young animals, that zoologist state is an important part of a young

animal's development, as it is learning other behaviours needed to survive as an adult. It is no different for humans and playing is essential not only for the development of social skills but cognitive thinking and mean-making that happens in "play" situations, not to mention imagination and creativity development.

A chalkboard, the playground, the water fountain, the grooming brushes and the mix 'n match blocks are the fun elements included in the farmyard. On the border of the chalkboard are illustrations of how to draw different types of animals. Some of our visitors don't often have this facility at school, so they really enjoy using it at the zoo. Sometimes the artwork is questionable as it accurately depicts the anatomy of various male animals. This is educational, of course, as it is biology after all!

With the exception of the playground equipment, the mix 'n match blocks attract the most attention and with numerous comebacks from children. The mix 'n match blocks encourage the development of basic problem-solving skills and basic spelling. The basic blocks have the picture of the animal and the word split over three blocks, which was adapted from the children's game of match the head, body and tail. The second set of blocks is more complicated as the visitor





GOOSE

"Chinese"
Family: Anatidae
Scientific name: *Anser anser*
STATUS: Domestic



Photo: Linda Mizukhi (JNB Zoo)

FEATURES
These probably originated from the wild Chinese goose. They can be either white or brown, and can be recognized by the knob at the base of the bill. They yield very good meat and more eggs than any other breed. They are not the hardiest of breeds.

DIET
Grass, concentrate pellets, grain.

BREEDING
They are prolific breeders and lay more eggs than any other breed.

DISTRIBUTION
Worldwide.

MASSES
Gander: 4,5 – 5,4 kg
Goose: 3,6 – 4,5 kg

DID YOU KNOW..?
Some are excellent egg-layers, managing over 80 per year, but a more reasonable number of eggs is 30-40. Younger birds achieve higher figures. Older geese produce fewer eggs.




needs to match up two blocks at the end of a maze. This mix 'n match puzzle looks at the domestic animal and its wild cousin, animal tracks and farm animal produce. As the visitor is not guided through these displays, the question was raised as to how the visitor knows if they are correct as these displays are not electronic. The answer is two fold. Firstly, the corresponding sides of the cube are painted in matching colours so when lined up correctly, the cubes are the same colour. Secondly, the mix 'n match puzzle aims to encourage discussions between adults and children. What was interesting in this display is that the children understand the puzzle blocks better than the adults!

Conclusion

Through observations, informal discussion and interviews, I can say with confidence that Badger Glen Farm is a space for children to play, learn and reconnect with nature. The variety of colourful displays appeal to different visitors but the common thread is that learning takes place through playing or social interactions. The design of the posters encourage adults to interact with their children and the interactive displays encourage interaction between all groups; adult to child, child to adult, child to child, adult to adult and of course human to animal. The visitors are free to choose to

interact with the displays or the animals (and the animals are free to choose to interact with people).

To conclude, Graue and Walsh (1995) state "The nature of contemporary children's lives, as they become increasingly institutionalised at school and day care, is such that they are constantly under the watchful eye of adults. Children are rarely given private places to work and play. Teachers and caregivers are told that they must be able to see all the children all the time." Badger Glen Farm gives the caregivers this security, whilst allowing the children the freedom to play, explore and learn. And from the reoccurring visits by our family groups and preschools, Badger Glen Farm creates not only memories but a lasting link to the natural environment for our young visitors.

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When does the zoo start to nag?

Testing the limits for pro-wildlife behaviour requests.



by **Liam Smith** (POSTDOCTORAL RESEARCH FELLOW), **Pieter Van Dijk** (SENIOR LECTURER) and **Jim Curtis**

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This paper reports on the findings of two studies examining how many times visitors can be asked to do pro-wildlife behaviours before their experiences are affected. In the first study, we examined how many different pro-wildlife behaviours could be asked before visitors' experiences were affected. In the second study, we asked the same question but concentrated on one behaviour. The results of both studies showed that some visitors' personal thresholds were crossed (3% in Study 1 and 9% in Study 2), but that almost all visitors indicated that their overall zoo experiences were not affected by being asked to act in support of wildlife. Indeed, respondents in both studies suggested that being given an opportunity to act in support of wildlife improved their zoo experience.

Introduction

Zoos have a strong vested interest in proactively influencing visitor behaviour such that the wild counterparts of captive animals can benefit from the actions of zoo visitors (Swanagan 2000; Stoinski et al. 2002; Smith et al. 2008; Povey and Spaulding 2005). Because of the many species that zoos keep, as well as the range of human-induced threats to each one of them, there are a plethora of visitor behaviours that zoos could seek to influence (Smith 2009). Two problems associated with having so many behaviours that could be requested are which behaviours to ask and how many should be requested during a zoo visit. While some research studies and zoos themselves have started thinking about which behaviours are most appropriate to request (Smith 2009; Smith et al., in press), investigations into the number of target behaviour requests remains unknown. On the one hand, if there are too many requests, zoo visitors may get the feeling that they are being harassed by the zoo to the point where their visit becomes less enjoyable. Furthermore, too many requests may lead to visitors

switching off and ignoring requests for target behaviours. On the other hand, by asking more, zoos may not negatively affect visitors' experiences and instead increase their chance of influencing visitors' behaviour. Thus, the legitimate question to be asked forms the subject of this paper – how many requests are too many?

There are several questions within the question of how many requests are too many. The first is whether the impact of individual requests varies with how they are asked and the type of behaviour being asked. A recent paper sheds light on both these questions showing that respondents felt that requests for simple, new and on-site behaviours were preferred, with the stipulation that the link between the action and how it helps wildlife is made explicit (Smith et al., in press). Results of this study also showed that requests for donations were contentious, with some respondents preferring not being asked too many times to donate. Respondents also indicated a preference not to be put under pressure or made to feel guilty when asked to act in support of wildlife.

In addition, two further questions surround how many requests for pro-wildlife behaviours can be made before visitors' experiences are affected. These questions are how many times *different* behaviours can be requested and how many times the *same* behaviour can be requested before the number of requests affects visitors' experiences and two studies were conducted to examine these questions.

Materials and methods

Two separate studies were conducted in two Australian zoos: Melbourne Zoo and Werribee Open Range Zoo (WORZ). In Study 1, ten different pro-wildlife behaviours were requested three times each in keeper presentations during the study. Visitors were intercepted as they dispersed from keeper presentations late in the day. 194 visitors participated in the study.

In Study 2, one behaviour – purchasing beadwork from the zoo shop to aid impoverished communities and wildlife in Kenya – was requested via face-to-face communication such as keeper talks, interactions with a costumed character and guided tours, and static media such as displays in the bistro, on walking trails and the zoo shop. All staff also wore beads. In this study, visitors were intercepted at the zoo exit. 508 visitors participated in the study.

In both studies, respondents were asked to recall how often and from where they had heard requests for pro-wildlife behaviour. They were also asked how many times the zoo should ask them to undertake pro-wildlife behaviour. Overall evaluations of zoo experience were assessed measures from the Interpretation Evaluation Tool Kit (Ham and Weiler 2005). In addition, the overall evaluation scale was also adapted such that it asked visitors to think specifically about how the number of behaviour requests they recalled affected their overall experience.



Results

STUDY 1

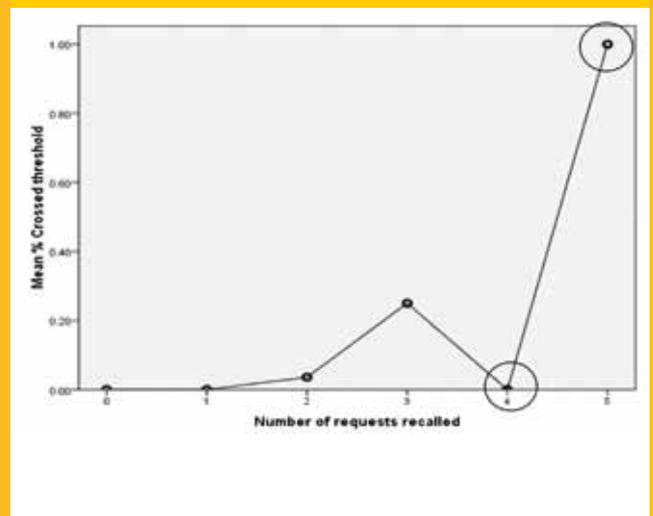
Key findings from the first study were:

On average, respondents could recall 1.2 requests. Almost all visitors (99%) felt that the number of requests they could recall being asked, either had no affect (12%) or improved (87%) their experience at the zoo. The data suggested that up to three recalled requests do not negatively affect visitors' experiences. Some visitors explicitly stated that *doing* on-site actions and / or learning how to help wildlife made their overall zoo experience better.

Respondents were asked, hypothetically, the maximum number of requests for different pro-wildlife behaviour the zoo should ask them to do during their visit. The average for this measure was 5.8. Each respondent's personal threshold was calculated by subtracting the number of recalled requests from their suggested maximum. For example, a visitor might indicate that they think the maximum number of requests should be five but during their visit they only received three. Thus their personal threshold wasn't crossed. Calculating this measure showed that less than 3% of respondents had their threshold crossed.

A new simple yes / no variable was created on the basis of whether an individual's personal threshold was crossed and plotting the mean of this measure against the number of recalled messages reveals visitor thresholds. While Figure 1 appears to show that thresholds are crossed at five requests, only one respondent recalled four and one recalled five requests (circled) meaning that more research is needed.

Figure 1 Personal threshold measure – Study 1 (n=162).



STUDY 2

Study two had a much larger sample than the first study.

Key findings from Study 2 were:

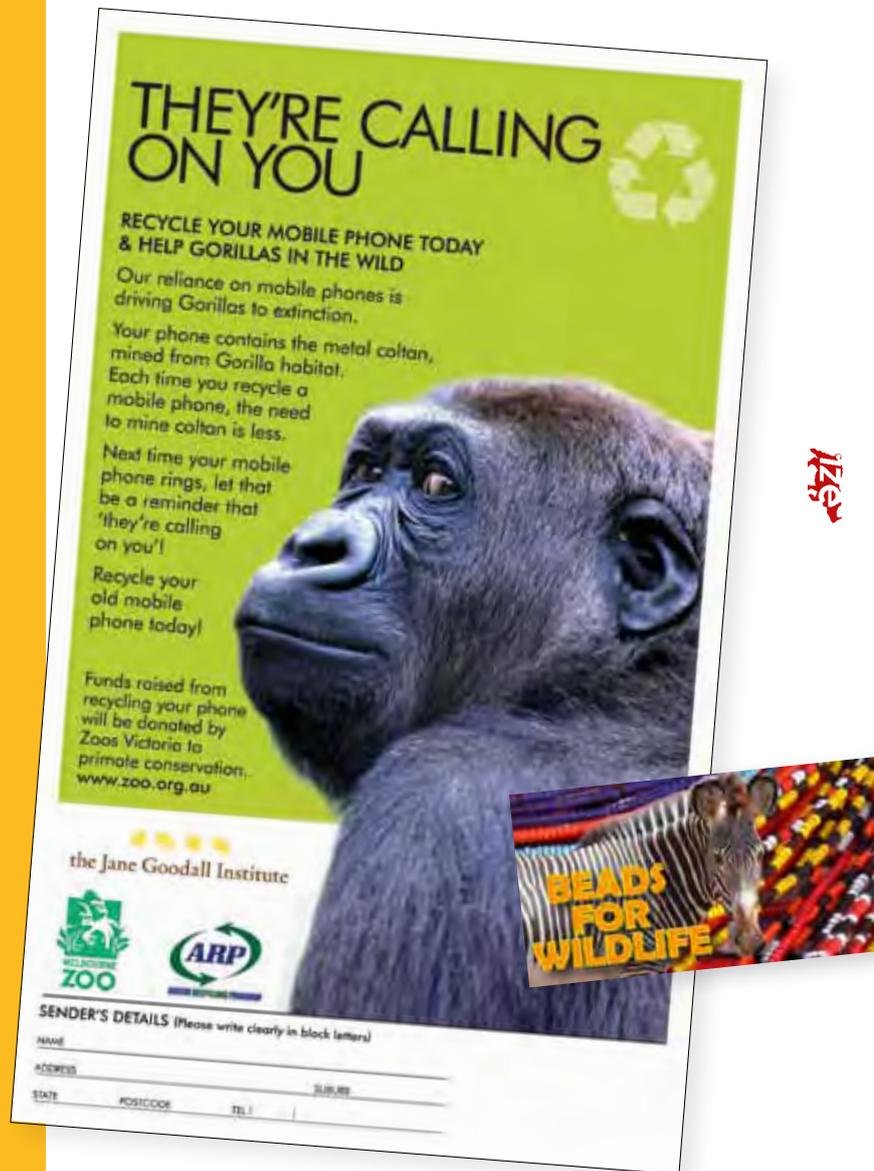
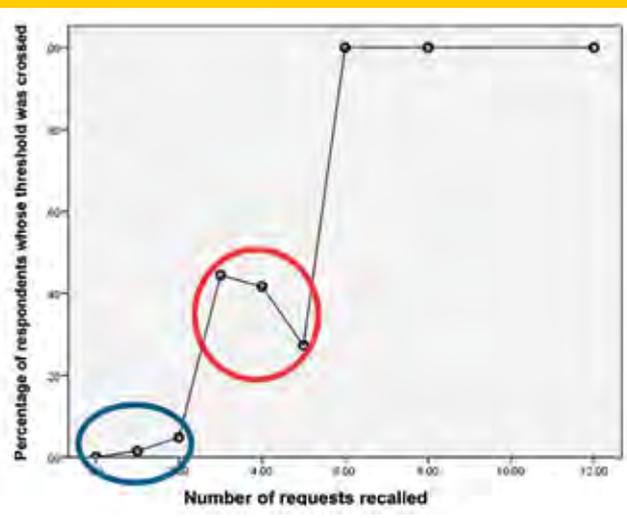
Seventy percent of respondents recalled seeing or hearing requests to buy beads from the zoo shop. Of those that did, the average number of requests was 1.2 requests (same as Study 1). Again, the majority of respondents (97%) indicated that the number of times they were asked to buy beads had either had no affect (52%) or improved (46%) their zoo experience. Less than 3% indicated that the number of requests made to them had a detrimental effect on their overall zoo experience.

Respondents were asked to indicate the maximum number of times the zoo should ask visitors to buy beads. The mean was 2.8 requests. Only five respondents (1.4%) suggested that the zoo should not ask them to buy beads at all.

The personal threshold measure was again calculated. Most respondents (62%) felt they could have been asked to buy beads more often than they were. Twenty nine percent felt that the number of requests they received was the same as the maximum the zoo should ask, while 9% indicated that they received more requests than the maximum, meaning their personal threshold was crossed.

Figure 2 shows that all respondents who recalled six or more requests to buy beads, also stated that the maximum number of requests should be less than six (i.e. their personal threshold was crossed). Up to two recalled requests (circled in blue) had little bearing on personal thresholds whereas the thresholds of 30-45% of respondents who recalled between 3-5 requests were crossed (circled in red).

Figure 2 Personal threshold measure – Study 2 (n=359).



Discussion

The key finding of the research is that most respondents in both studies indicated that zoo requests had little impact on their experience at the zoo. Where it did make an impact, more requests were often associated with improved zoo experiences rather than a negative impact, particularly in the first study. However, in the first study respondents only recalled, on average, 1.2 requests meaning that respondents may have noticed pro-wildlife behaviours that resonated and not attended to those that didn't. In the second study, most respondents indicated that the number of requests had no bearing on their overall experiences. The combination of results suggests that multiple requests for different behaviours are associated with improved experiences whereas multiple requests are fairly neutral in their impact on visitors' experiences.



Results from the personal threshold measure were most relevant to the question of how many requests for the same behaviour are too many. Using this measure, small groups of respondents were identified (3% in Study 1 and 9% in Study 2), who felt that they were asked to undertake pro-wildlife behaviour more times than was appropriate. The results of the personal threshold measure in Study 1 suggest that respondents' personal thresholds were not crossed and that there was scope for more different requests. Conversely, Study 2 did appear to genuinely establish a threshold. All respondents who recalled more than six requests had their personal threshold crossed. The observation that respondents' overall experiences were not affected by the number of times they were asked, suggests that crossing the personal threshold for requests does not lead to negative zoo experiences. It seems likely that upon noticing the third, fourth, fifth or sixth request, visitors remembered the request and stopped paying attention.

Conclusions

The results provide some qualified support for the zoo industry to ask visitors to act in support of nature more often. It seems that visitors, to the Australian zoos involved in this study at least, are receptive to requests for participation in pro-wildlife behaviour.

Perhaps the most obvious area for further research is to repeat the second study with another behaviour. The criteria for behaviours set forth by visitors (in Smith et al., in press) were, for the most part, met in the choice of behaviour for the study. That is, buying beads for wildlife is a novel behaviour, it is done on-site, it's easy and visitors can see how it helps wildlife. It would be interesting to see whether visitors felt the same way about repeated requests for another behaviour if it was well known (not novel) off-site, difficult, or had a tenuous link to how it helped wildlife.

Research is also needed to examine whether multiple requests translate into actual behaviour. Some modelling done as part of the second study suggested that more requests were not associated with increased purchase and this finding needs to be explored.

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