

Ice Station Antarctica
Summative Evaluation Report

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1. Executive summary

- Ice Station Antarctica is an engaging exhibition for families and schools that is enhanced by the presence of face to face facilitation
- The mean dwell time of visits was 36 minutes.
- Students interviewed were able to understand the key messages and did take away some cognitive learning. They also enjoyed the exhibition and had affective learning experiences.
- Their enjoyment and learning was hampered by the fact that some of the students were unable to access all the interactives or bar coded activities as they were in large groups.
- The online experience was rated highly and was mainly used by children in families or adults planning a visit.
- Visitors seemed to like the 'drip feed' approach to updating the site over time.
- The face to face experience with the volunteers enhanced visitors' learning and enjoyment in Ice Station Antarctica.
- Those visitors who did interact had a broader range of memorable cognitive learning and found some of the issues they covered in the interaction surprising.
- Most visitors did not change their behaviour as a result of their interaction but some said they would look out for similar facilitators and look at objects/specimens more closely.
- Interaction with the volunteers increased visitor's dwell time in the exhibition.

2. Introduction

Ice Station Antarctica is a temporary, touring exhibition that was initially exhibited at The Natural History Museum. It aims to show what life is like in Antarctica for the scientists who work there and gives an insight into the kind of research undertaken in Antarctica. It is aimed primarily at families with children aged 7-11. The secondary audience is school groups aged 7-11.

This report is a summative evaluation of four aspects of Ice Station Antarctica:

- Visitor tracking - what visitors do in the exhibition.
- Interviews with school visitors – what school children thought of the exhibition.
- Online pop up survey – virtual visitors' experiences.
- Exit survey around the role of facilitators in Ice Station Antarctica

This report will examine the success or otherwise of Ice Station Antarctica in these four areas.

The evaluation was designed by Georgina Bishop with input from Gina Koutsika, Greg Hall and John Benfield. Many people have inputted in data collection: Alex Gaffikin, Gina Koutsika, Claire Henry, Emily Tomlinson, Raphael Chanay, Berwyn Jones, Catherine Hockings, Christina Fisher, Carmen Thomas, Dim Meehitiya, Oomar Dhuru, Sandra Sterman, Andrew Cornwall, Shayna Barby, Pip Biltcliffe, Katherine Hinkel and Amanda Shirley.

Other summative evaluation reports about Ice Station Antarctica have also been commissioned including a family exit survey and peer review. It is not the intention of this document to compare findings, however where appropriate, reference and comparison will be made to the Dino Jaws exhibition.

Dino Jaws was the previous “family blockbuster” exhibition at the Natural History Museum occupying the same space. It was also targeted at family groups and schools, although a slightly younger age group.

3. Visitors behaviour in Ice Station Antarctica – what did they do?

Method

In order to find out about how visitors used Ice Station Antarctica, they were unobtrusively tracked around the exhibition. Visitors were observed to see what parts of the exhibition they engaged with. Visitors' routes and stops were recorded on a plan of the exhibition space. Different codes were used wherever visitors stopped to indicate what type of interaction occurred. For example, R signified that visitors read some text or T that they talked to another visitor. Dwell time in the exhibition was also measured.

An example plan of the exhibition that was used in the tracking can be found in the appendices.

Tracking visitors is a useful exercise because:

“these unobtrusive, objective measures which focus on time and attention are valuable indicators of the exhibits attractiveness and interest to visitors and these factors have been found to correlate positively with learning and enjoyment.”

Serrell, VSA Workshop 2005, modified from *Paying Attention: Visitors and Museum Exhibitions*, Serrell, 1998

Profile

When visitors were tracked around the exhibition their approximate age was recorded. As with Dino Jaws, just over half of those tracked were children (53%)

Figure 1: Age of tracked visitors

Age	Number of visitors
Under 5	0
5-11	42
12-17	11
18-24	13
25-44	24
45+	10

Figure 2: Group size of tracked visitors

Number in group	Number of visitors	
	ISA	DJ
1	5	4
2	34	24
3	22	16
4	13	24
5-10	13	6
10+	5	6
No data	8	10

It can be seen from the data above that visitors to Ice Station Antarctica were mostly likely to be in groups of two or three, usually one or two parents with one or two children. There are some interesting differences between the Ice Station Antarctica and Dino Jaws group sizes. It would seem that family groups visiting Dino Jaws were more likely to be in groups of four than Ice Station Antarctica

The observers noted down how busy the exhibition was in order to ensure visitors were observed during a range of busy and quiet times. The exhibition was marked as 1, 2 or 3 where 1 was the most busy and 3 the busiest.

Figure 3: Busyness of Ice Station Antarctica

How busy	% of observations ISA	% observations DJ
1	52	45
2	35	26
3	9	30
No data	4	

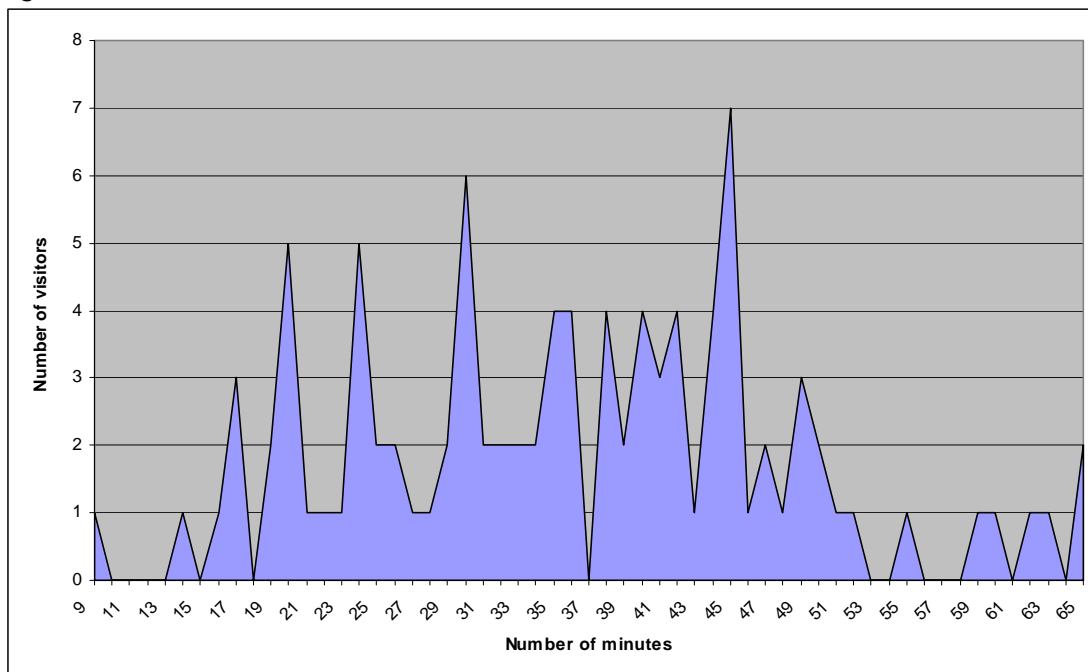
Compared with Dino Jaws, Ice Station Antarctica was observed at much less busy times, even though the same pattern of choosing variable times of the day and term time, holiday and weekend periods was used.

Dwell times

Visitors were timed during their visit. Dwell time is a useful measure as it is an indicator of how engaged visitors are in an exhibition. Visitors to Ice Station Antarctica’s dwell times were also noted as they exited the cold room to find out if this area, including waiting to go into the room, added greatly to their time spent.

Visitors spent a mean and median average of 36 minutes in Ice Station Antarctica. This is eight minutes longer than the mean dwell time of Dino Jaws.

Figure 4: Mean dwell time of tracked visitors



Those in school groups spent an average of 44 minutes and those in smaller groups, 35 minutes. This corresponds with an increased dwell time for those school groups who visited Dino Jaws. This shows the continued engagement of school groups with temporary exhibitions.

The visit to the cold room did not add significantly to the dwell time. Visitors spent an average of four minutes in the briefing area and cold room. This shows that visitors were engaging with the main exhibition space, not just waiting to use the cold room. It should be noted, however, that visitors’ queuing time outside the exhibition threshold has not been included here and may have added significantly to the time spent at the exhibition.

3.4 Further observations

In addition to timing, further observations about what visitors did in the exhibition were noted.

Visitors made an average of 23 stops during the 36 minutes they were in Ice Station Antarctica, spending an average of 93 seconds at each stop. This compares with 34 stops in 28 minutes in Dino Jaws. This may be because most of the interactives took longer to complete in Ice Station Antarctica or because of the slightly older target audience or indeed because visitors were more engaged in the exhibition.

Visitors to Ice Station Antarctica were likely to speak to others in their party six times, much lower than the Dino Jaws total of 16 times. Conversation during exhibitions is a good measure of visitor's engagement and the more engaged they are they higher likelihood of learning. However, many of the key exhibits such as the Skidoo game were single player interactives rather than exhibits which encourage conversation such as the animatronic dinosaurs so visitors may have learnt by using the interactives rather than through conversation.

Visitors to Ice Station Antarctica read an average of eight pieces of text. Adults were more likely to read text than children. For example most of the children in school parties read no text at all. Visitors to Ice Station Antarctica were more likely to read text than visitors to Dino Jaws, who read five pieces of text on average.

These figures show that unlike Dino Jaws, visitors to Ice Station Antarctica were more likely to read text than talk to each other.

On average, visitors used eight exhibits in Ice Station Antarctica. This was most likely to be the Skidoo game. Again this is fewer than the number used by visitors to Dino Jaws (n=15) but this is likely to be because of the more in depth nature of the interactives in Ice Station Antarctica.

Visitors had to queue up to use an exhibit an average of once in Ice Station Antarctica. This compares with an average of two instances of queuing in Dino Jaws. Areas which visitors were most likely to queue up were Dress Jack, the Under the Sea Ice games and the Skidoo games. Even those in larger groups had to queue up an average of twice. Unsurprisingly, busy periods led to an increase in queuing.

Visitors to Ice Station Antarctica watched others using exhibits five times. They also sat down once.

A new category was added to this observation sheet which was not on the Dino Jaws sheet: glance. This allowed the observer to note down when visitors looked at an exhibit without stopping. Visitors glanced at an average of five exhibits in Ice Station Antarctica without stopping at them.

The tracking also shows up which areas of the exhibition were the most used. From this it is possible to say which areas were the most successful in engaging visitors.

The visitor flow pattern of Ice Station Antarctica shows that all visitors except one used the cold room experience. The most popular game was the Skidoo game.

Visitors appeared to be most engaged during the middle of the exhibition during the Antarctic Animals, Under the Sea Ice and Skidoo pods. After the Skidoo section, visitors were less likely to stop and read or use the exhibits.

This is the opposite of Dino Jaws where the most popular exhibits were at the end. However, this was because the largest, wow factor exhibits were located here and is typical of many museum going experiences. Both Ice Station Antarctica and Dino Jaws are modular exhibitions and are configured differently in touring venues for this reason.

4. Interviews with school children

4.1 Method

The evaluator visited five classes of school children in three schools who had visited Ice Station Antarctica approximately a week previously. Formal learning groups are a small but important part of the exhibition visitor demographic, totalling approximately 10,000 visits so it was important to find out if the exhibition worked well for schools as well as family groups.

The students were from a variety of backgrounds and in Key Stage Two.

The discussions with the students were conducted in an informal manner in small groups away from the rest of the class. Questions were prepared but the majority of the discussion was led by the students themselves. The students were very enthusiastic and excited to participate and so the evaluator tried to ensure that they were accurate in their assessment of their visit.

The data in this section is highly qualitative in nature and so numbers and figures have not been included. The data is intended to show the range of answers given by the students.

4.2 Key messages

All of the students were able to say what the Ice Station Antarctica exhibition was about. IN particular the students mentioned being able to survive in Antarctica and the scientists who worked there. This shows that the key message from the exhibition was being taken away by the students. Many of the students also picked up on the challenge aspect of the exhibition.

“how people survive in Antarctica”

“how it would be to live there. Teaching us how to survive there”

“what it’s like to live there - could you manage to live there”

The students were enthusiastic about the exhibition and felt that they had really enjoyed it. They were able to remember a high level of detail about what they did and the exhibits they used.

4.3 Popular exhibits and cognitive learning

One of the most popular areas mentioned by the children was the Skidoo and the Skidoo interactive. Some of the children were able to remember that the point of the game was to collect meteorites. However, the children also frequently mentioned crashing the Skidoo and deliberately knocking over the penguins in the game which seemed to be more of a focus than the collecting of meteorites. The children were not able to say why they were collecting the meteorites but they had learned that Antarctica is a good place to collect them.

“I loved the Skidoo game too – crashing the Skidoo and driving to see how hard it is”

“the Skidoo game, got to collect meteorites, allowed to kill penguins and got to sit on a jet ski”

“had to collect the meteorites and then study them”

“that meteorites land in Antarctica”

The students also frequently mentioned the cold room as one of their favourite areas of the exhibition.

“the freezer room – it made you really cold – like sitting in a fridge”

“if stay for a few hours would die. In 10 minutes you would get frostbite”

In terms of learning from the exhibition, not only were the students able to identify what the exhibition was about, they also mentioned areas of content that they had picked up from using the exhibition.

For example, some students mentioned the people who stay in Antarctica and what it would be like to live there:

“the food they eat – sugary stuff to keep and energy”

“they wear warm jackets for the cold”

“you can’t leave any rubbish on Antarctica”

Another mentioned wildlife:

“that the seas around are filled with ancient life forms e.g. undiscovered fish”

Some of the students had interacted with the facilitators and mentioned things they had learnt through their interactions, particularly about volcanoes.

4.4 Less successful areas

Although the students had enjoyed their visit and many mentioned the interactives, it transpired that some of the students had only used a minority of the interactives because of problems with scanning their tickets, queuing or a lack of time. These issues seemed to be a particular problem for school groups compared to the family groups and caused frustration for the students. This seemed to mirror the frustrations of the students who attended the Dino Jaws exhibition.

“people were hogging the games”

“needed to scan tickets. Sometimes it didn’t work”

“had to move on before I got a chance to play”

The students were asked if there were any areas of the exhibition that they did not like. One area that was mentioned several times was the Base Station area. The students felt that there was not enough to do in this section of the exhibition.

“the bed part was boring – the suitcase was stuck on the bed”

“couldn’t turn the TV on”

“the bed was sealed – everything stuck together”

The students were asked if they had used their tickets to log on to the Ice Station Antarctica website. Most of the students had not used their tickets in this way. A minority of students had logged on but this was always at home rather than at school. The teachers did not use the website with their classes before or after the trip.

All of the teachers mentioned that they had used the visit to Ice Station Antarctica as an affective rather than cognitive learning experience and were pleased with their visit. None of the students were specifically learning about Antarctica at the time. The visit was successful as an affective learning experience for most of the students and additionally they did take away key messages and cognitive information from the exhibition.

5. Online survey

5.1 Introduction and method

The Ice Station Antarctica exhibition comprised of two websites. The main Ice Station Antarctica website gives information about the exhibition, about Antarctica and included games and activities. There is also an 'online expedition' website which is only available to those who have visited the Ice Station Antarctica exhibition. To access it, visitors must key in the barcode number from their ticket. The site allows visitors to access information and games from their visit along with new activities. The activities are 'drip fed' so that visitors can return to the site to play new games over a period of time.

Pop up surveys were placed on both sites in December 2007. In total 130 visitors completed the Ice Station Antarctica main site pop up and 89 the 'online expedition' part.

5.2 Visitor profile

Figure 5: Age profile of online visitors

Age group	% of visitors to ISA site	% of visitors to online expedition
Under 8	10	18
8-11	24	37
12-17	8	15
18-24	9	3
25-34	21	8
35-44	18	11
45-59	9	3
60+	3	0

The profile above shows that the visitors to the website were similar to those who visited the physical exhibition. Visitors who were visiting the main site were most likely to be children aged 8-11 or adults aged 25-34. It is likely that the two groups were using the site for different purposes. Adults were most likely to be researching a visit.

Visitors to the 'online expedition' part of the site were most likely to be aged 8-11. This profile fits in well with the target audience of families with children aged 7-11.

The online profile is similar to that of Dino Jaws; however the children tended to be slightly older than those who visited Dino Jaws. This is reflected in the exhibition audience as a whole.

Over half (54%) of the visitors to the main site had already visited the physical exhibition. This is the same figure as for Dino Jaws.

5.3 Booking a visit

Visitors who had already visited the exhibition were asked how they had booked their tickets.

Figure 6: How visitors had booked their tickets

Method of booking	% of visitors ISA	% of visitors Dino jaws
On line	26	12
By phone	2	5
At the Museum	52	67
I didn't book the tickets	16	11
Other	4	5

As can be seen from the table above, most visitors bought their tickets for the exhibition at the Museum. However, there is a significant increase in the % of visitors booking their tickets online for Ice Station Antarctica as compared with Dino Jaws.

5.4 Reasons for visiting

Those visitors who had not visited the exhibition were asked for their reasons for visiting the site. As shown by the table below, most visitors were planning a visit to the physical exhibition. A large minority, however, wanted to find out more information about Antarctica. This follows the same pattern as the results for the Dino Jaws survey, except that a higher proportion of visitors wanted to use the site to find out information and play games.

Figure 7: Visitors' reasons for visiting the site

Reason	% of visitors ISA	% of visitors Dino Jaws
To plan a visit	35	51
To find out information	30	23
To play games	17	9
Just browsing	10	9
By accident	5	3
Other	3	5

5.5 Visitors views on the site

Visitors were asked to rate different aspects of the Ice Station Antarctica website. Most visitors rated the website highly in all areas. In particular, the information about Antarctica was rated highly.

Figure 8: Visitors rating of aspects of the Ice Station Antarctica website (%)

	Very poor	Poor	Good	Very good
The games	7	4	50	39
The way the website looks	5	3	58	33
The information about Antarctica	5	3	44	48
The information about the ISA exhibition	6	9	46	40

Figure 9: Visitors' rating of aspects of the Dino Jaws website (%)

	Very poor	Poor	Good	Very good
The games	4	4	57	33
The way the website looks	6	3	46	45
The information about dinosaurs	6	7	42	46
The information about the DJ exhibition	5	5	45	44

It can be seen that both Ice Station and Dino Jaws were rated highly by visitors to the website. Ice Station Antarctica scored particularly well on the information about Antarctica and the games but less well on the way the website looked and the information about the actual exhibition in comparison to Dino Jaws.

5.6 Other areas visited

Most visitors had also browsed though other parts of The Natural History Museum website. In particular Visit Us and Kids Only were popular with Ice Station Antarctica users These findings are the same as Dino Jaws.

Figure 10: Areas of the NHM website visited

Area visited	Number of visitors
Visit Us	36
Nature Online	23
Kids Only	24
Education	12
Take Part	9
Buy Online	11
Other	9

5.7 How visitors used the website

Visitors were also asked if they were using the website alone or with others. Most visitors were using the site alone. Although these were most often adults, some children were also using the site alone. These findings are the same as for Dino Jaws.

Figure 11: How visitors were using the website

Type of use	% of visitors to ISA	% of visitors to Dino Jaws
On your own	62	55
With family	27	32
With friends	6	5
At school	4	4
Other	1	4

As with Dino Jaws, there were a low proportion of visitors from schools using the site. This may have been because the digital trail did not support the needs of school groups as well as the family audience.

5.8 Registering the barcode

Visitors to the Ice Station Antarctica main site were asked if they had registered the barcode number on their ticket to access the Dino Club part of the site. A third of the sample mentioned that they had used their ticket to do so. A quarter answered that they had not used their ticket and the rest did not answer.

5.9 Online expedition site

Visitors to the 'online expedition' part of the website were also surveyed. These visitors had all visited the physical exhibition and used their tickets to log on to the site.

5.9.1 Areas of the NHM site visited

Visitors were asked if they had visited other parts of The Natural History Museum website that day.

Figure 12: Other areas of the NHM site visited by 'online expedition' visitors

Area visited	Number of visitors
Visit Us	12
Nature Online	11
Kids Only	25
Education	7
Take Part	8
Buy online	5

Visitors were most likely to have visited the Kids Only section of the website. This is consistent with the visitor profile of the site.

Even though most of the users of the 'online expedition' part of the site were children, 58% were using the site alone. Most of the remainder were using the site with family. By contrast, only 2.2% of visitors were using the site at school.

5.9.2 Rating the online expedition experience

As with the main Ice Station Antarctica website, visitors were asked to rate different aspects of the site.

Figure 13: Visitor's rating of aspects of the online expedition area

	Very poor	Poor	Good	Very good	Didn't use
Get packing	6	10	37	38	7
Underwater mix up	6	6	36	39	10
Meteorite magic machine	5	7	35	36	15
My journal	1	7	35	40	14
My certificate	0	6	28	37	21

The table above shows that the My journal aspect of the online expedition was the most highly rated element of site. However, all of the aspects were rated highly by those who used them. The My certificate element was the least well used. This contrasts with the popularity of the certificate element of the Dino Club site where the My certificate was well used and highly rated.

5.9.3 Frequency of visiting the online expedition

Most visitors to the online expedition site had visited it more than 3 times.

Figure 14: How many times visitors had used the online expedition area

	%
1 st visit	21
2 or 3 times	9
More than 3 times	67

This is in contrast to the Dino Club site where most visitors were making their first visit. One of the features of the online expedition was that different activities were 'drip fed' to visitors gradually over a period of time in order to encourage them to revisit the site. This approach seems to have worked.

With regard to this approach, visitors were asked what they thought of the commander sending them updates to new games and activities. 78% of visitors said that they enjoyed having new activities to try that are added bit by bit. 17% said that they would prefer all the activities to be available the first time they registered.

6. The use of facilitators in Ice Station Antarctica

6.1 Method and profile

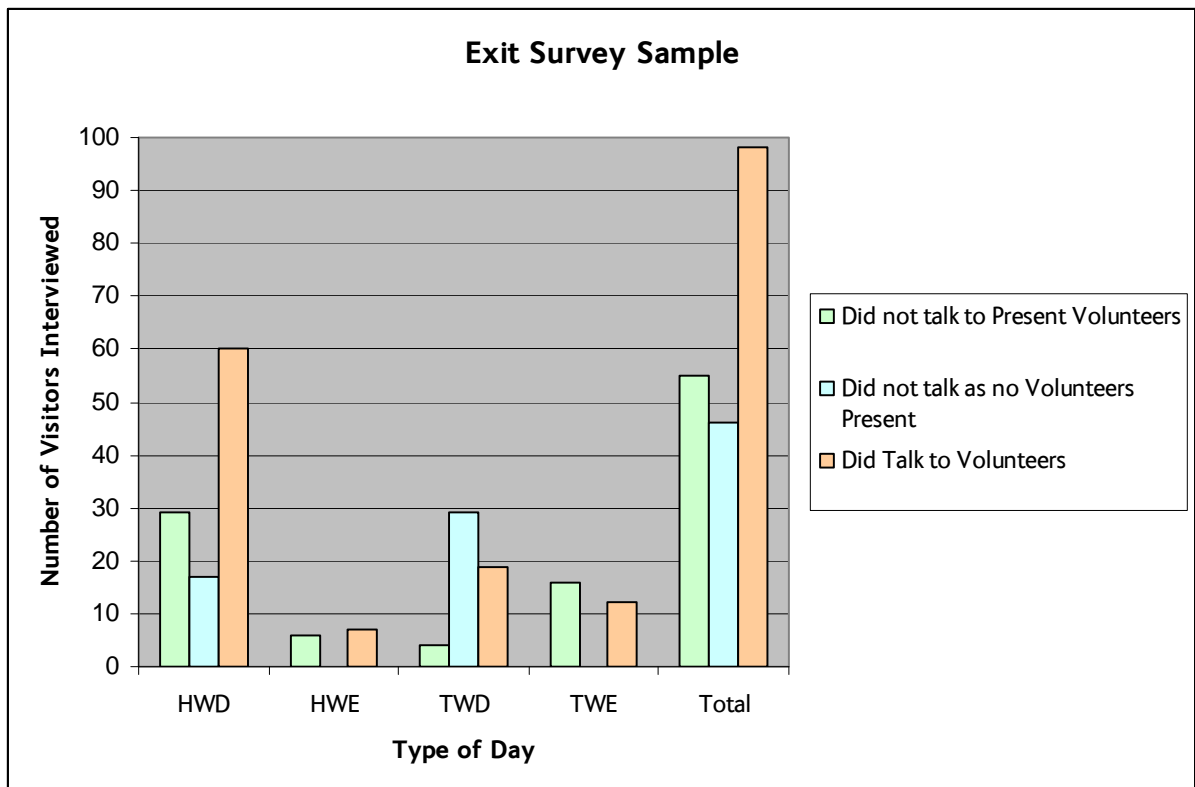
The Ice Station Antarctica exhibition had volunteers engaging visitors with specimens during part of the week.

The rationale for using face to face facilitation was to provide learners with the opportunity to:

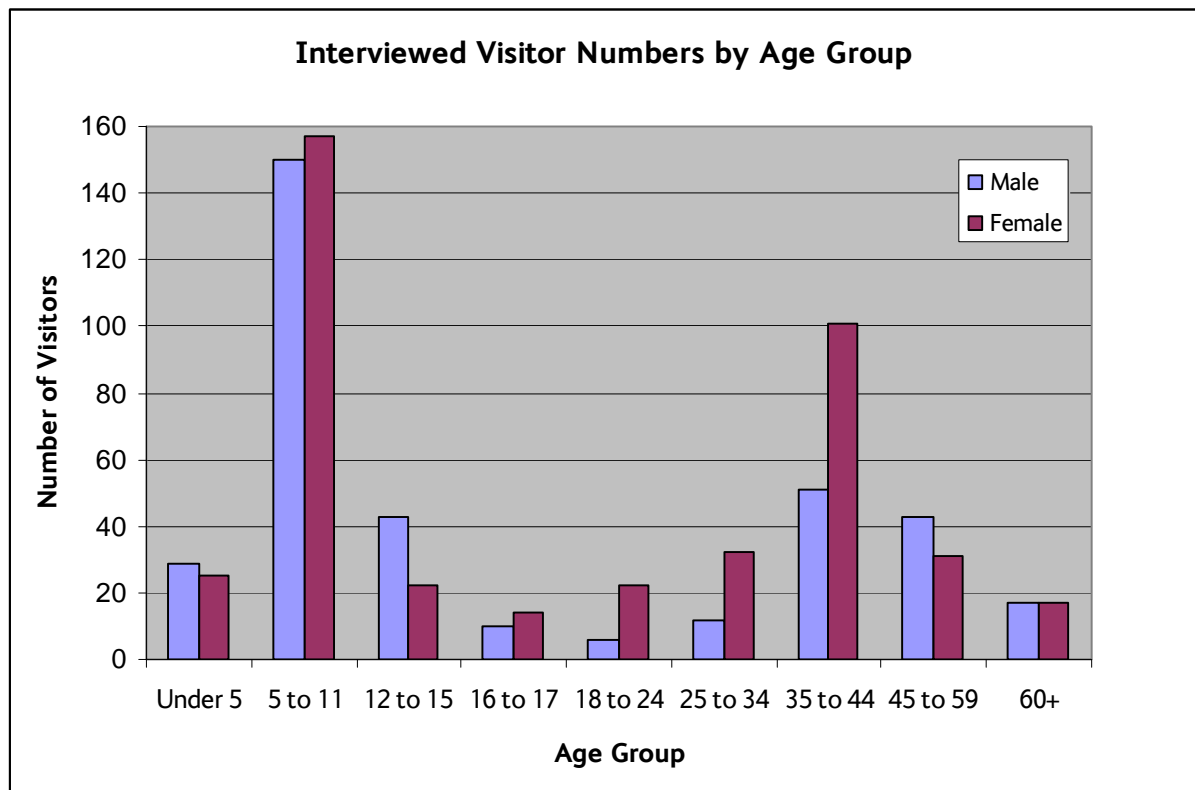
- Engage in dialogue and ask questions
- Encounter, observe and investigate real, authentic objects or specimens to develop scientific enquiry skills
- Use a variety of senses
- Develop their own learning experiences and draw their own conclusions
- Relate new learning to their prior experience or knowledge
- Learn about the work of the Natural History Museum; making it more accessible, enjoyable and relevant.
- Share the enjoyment and fascination of the natural world inspiring a sense of wonder
- Make their experience more interesting, more enjoyable and more memorable.

The aim of the study was to find out if face to face facilitators brought added value to the visitor experience in Ice Station Antarctica. This was achieved through an exit survey with 200 visitors. Approximately half of those visitors had interacted with a volunteer and half had not. Visitors were approached as they left the exhibition and asked if they would take part in a short face to face survey. Visitors were approached during term time weekdays (TWD), term time weekends, (TWE), holiday time weekdays (HWD) and holiday time weekends (HWE).

Figure 15: Visitor profile by type of day



Although many of those interviewed were families, the responses of one nominated individual were taken. The chart below shows the profile of the visitors and their groups who were surveyed. The large number of children aged 5-11 are due to the school groups who were interviewed. In fact, most of those interviewed were adults.



6.2 Learning

6.2.1 Memorable aspects

Visitors were asked what was the most memorable thing about their visit to Ice Station Antarctica. Visitors were asked this question to try and find out what kind of cognitive learning they had taken away from the exhibition.

For all the visitors the top four responses were the Cold Room, the Skidoo, the interactives and the penguins and penguin vomit

“the freezer bit....it made me think about how cold it must be”

“I’ll definitely remember the -10 degree room”

Visitors’ most memorable aspects of the exhibition can be found in the tables below.

Figure 17: What visitors who did not interact with a facilitator found memorable

Aspect of Exhibit	Visitor Responses
Cold Room / Freezer / Cold	38
Skidoo	31
Computer Games / Interactives	14

Penguins / Penguin Sick	13
Meteorites	4
Tent	4
Views Under Ice	3
Under the Sea Ice	2
Dressing Up	1
Food	1
Videos	1
Overall	1
Nothing	1

Figure 18: What visitors who did interact with a facilitator found memorable

Aspect of Exhibit	Visitor Responses
Cold Room / Freezer / Cold	36
Snow Mobile	24
Penguins / Penguin Sick	12
Volunteers	11
Computer Games / Interactives	9
Under the Sea Ice	6
Nothing	5
Overall	4
Volcanic Rock / Rocks	4
Working in Gloves	2
Meteorites	1
Dressing Up	1
Tent	1
Pictures of Storms	1
Pictures of Midnight Sun	1
Auroras	1
Fossil Shells	1
Krill	1
Equipment	1
Biodiversity in sea	1

The main differences between those who did and did not interact with the volunteers were that a much broader range of memorable aspects were mentioned by those who had spoken to the volunteers. This would suggest that interacting with the volunteers helped to enhance the cognitive learning value of the exhibition.

This is illustrated by the diagram below.

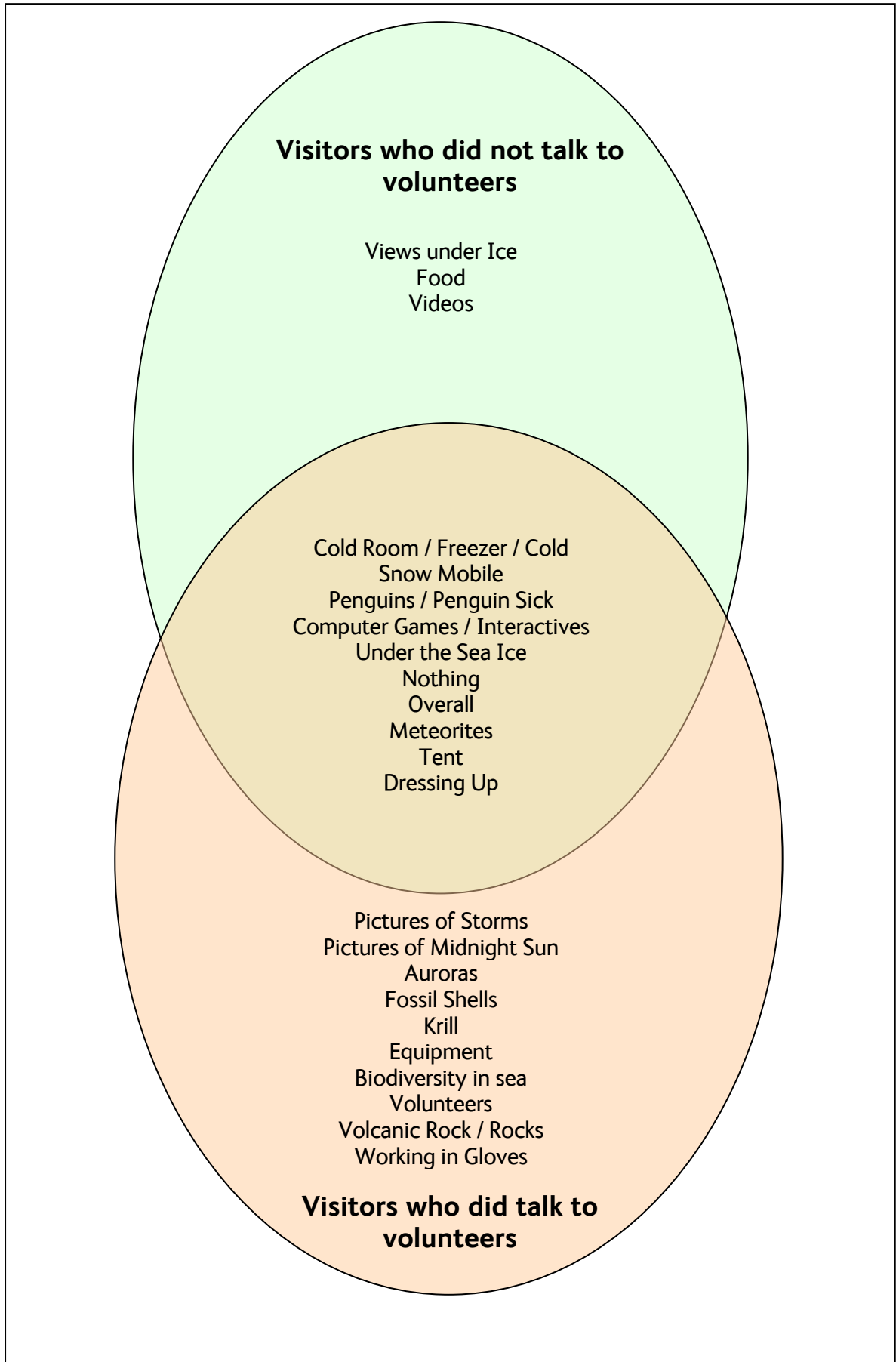


Figure 19: What visitors found memorable about Ice Station Antarctica

6.2.2 Surprising aspects

In order to find out more about the learning that occurred in the exhibition, visitors were also asked if there was anything in Ice Station Antarctica that surprised them. Finding an exhibit or theme surprising can show that visitors have learnt new knowledge or that they have taken away an affective learning outcome.

All visitors to the exhibition were likely to find the cold room and the penguin's diet and vomit surprising. Additionally a common response from visitors was that they found had not found anything very surprising in the exhibition.

“the harsh conditions – it was a great practical experience”

“the penguin vomit and seeing all the squid and the fish in there”

A full list of responses are below:

Figure 20: What visitors who did not interact with the volunteers found surprising

Aspect of Exhibit	Visitor Responses
Cold Room	21
Nothing	18
Penguin Sick / Diet	16
Snow Mobile	6
Cold (-24 deg C)	4
Clothes	4
Under the Sea Ice Under Ice	4
Games	4
Living Conditions	4
Using the toilet	3
Practical Experience	3
Darkness for a long time	2
Human diet / food / drink	2
Weather Conditions	2
Busy Exhibit	2
Different penguins	2
Violent Storms	2
Too expensive	1
Meteorites	1
No Polar Bears	1
No Aerosols	1
Buildings	1
Environmental Monitoring	1
Make Friends w/ seal	1
Auroras	1
Scientists have to know everything	1
Seal Puke	1

Figure 21: What visitors who did interact with volunteers found surprising

Aspect of Exhibit	Visitor Responses
Penguin Sick / Diet	24
Nothing	19
Cold Room	10

Volcanic Rock	8
Snow Mobile	4
Darkness for a long time	4
Living conditions are extreme	4
Cold (-24 deg C)	3
Too expensive	3
Human diet / food / drink	2
Working in Gloves	2
Clothes	1
Under the Sea Ice Under Ice	1
Using the toilet	1
Weather Conditions	1
Meteorites	1
No Polar Bears	1
Hard looking for fossils	1
Krill are small	1
Not enough interactives	1
Spiders - 10 legs	1
Volcanoes	1
Volunteers	1
Ice Expansion	1
Icebergs	1
Antarctica was once warm	1
Penguin Feathers	1
Scientists have nothing to entertain them	1
Post comes once a year	1
Seals eat penguins	1

The wide ranges of responses are indicative of the variety of learning outcomes that visitors took away with them whether they had interacted with the volunteers or not.

The main differences between those who did or did not interact with the volunteers was that some of the aspects that were explored by the volunteers were not covered by the general exhibition and these were areas that people appeared to find surprising such as the volcanic rock. Additionally those who had had a volunteer interaction mentioned change in ice throughout the year and long term climate change in Antarctica.

“how much the ice expands, especially in winter. That’s amazing”

“that there’s volcanoes in Antarctica. We never knew that”

Below is a comparative diagram detailing visitors’ responses.

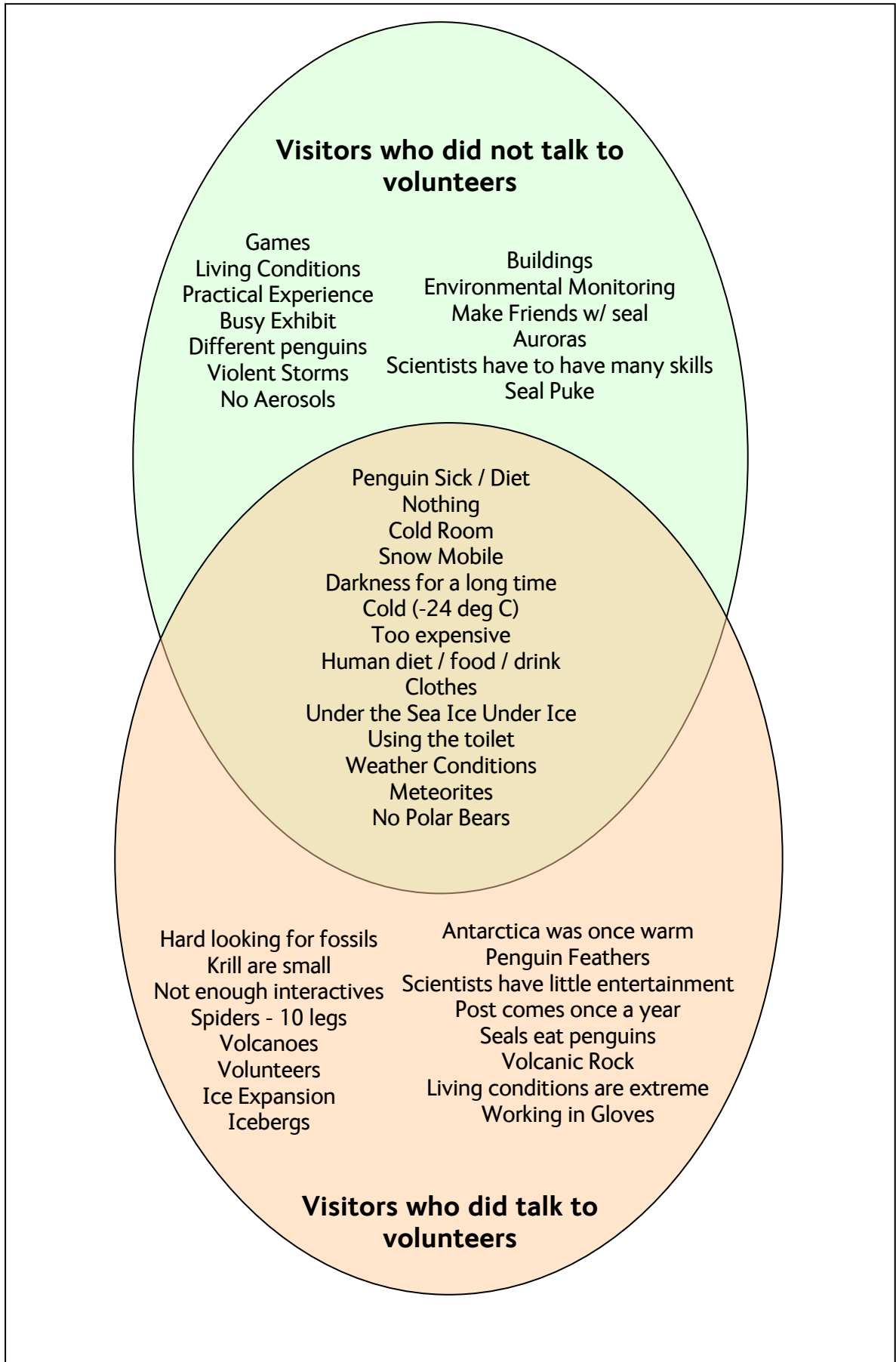


Figure 22 above: What visitors found surprising about Ice Station Antarctica

6.3 Visitors' face to face interactions

Those visitors who had had a face to face interaction with a volunteer were asked what happened during their conversation.

Figure 23: Visitors facilitated conversations

Topic Discussed	Visitor Responses
Rocks	43
Snow Gloves	35
Fossils / Shells / Shellfish	27
Penguin Feathers / diet	5
Krill	3
Volcanoes	3
Lava	1
Rock formation	1
Talked about School Group	1
Icebergs	1
Geography	1
What scientists do in Antarctica	1
What you can bring with you	1

As can be seen from the table above, visitors were most likely to talk about the different activities that they explored with the volunteers, in particular the different rocks, using the snow gloves to pick up items and the fossils and shells.

“we tried on the snow gloves. Wow. They were so warm”

“using the mittens and seeing how hard it is to work with the protective clothing. We couldn't pick the 5p up with the gloves”

“he showed us these two rocks. One was lava and had been shaped by the wind. It's so interesting”

“they explained to me all about how pumice stones are created”.

In order to probe further about visitors' learning during their face to face interactions they were asked what they thought they would remember most about the activity they did or the conversation they had.

Figure 24: What visitors will remember most about their face to face interaction

Topic Discussed or Activity Completed	Visitor Responses
Picking up / Handling Rocks and Fossils	17
Difficulty of using gloves	16
Trying on gloves - their size, warmth, softness	14
Fossils / Shells	13
Rock Weights	7
Answered Questions	6
Rock formation	3
Importance of warm clothing / losing skin in cold	3
Icebergs are blue	3
Penguin Feathers	2
Nothing	2
Cold Room	2
Once warm in Antarctica	2

Working in Antarctica	2
Antarctica moved	2
Krill - small	1
Volcanoes	1
Shellfish diet	1
Vomit	1
Warmth of clothes	1
Everything	1

The parts of their experience that visitors felt they would remember most link directly with their descriptions from the earlier question. Visitors were most likely to remember being able to handle the rocks and fossils.

“finding out how the wind smoothes the stones – they felt so lovely”

“I can’t believe there was so much to find out from the rocks. I’m an old lady and I thought I’d hate it. But I changed my mind and now want to go to Antarctica”

The other practical activity of wearing the snow gloves was also a memorable experience for many of the visitors. Some of them were also able to relate it back to the scientists working in the field.

“how difficult the job must be working in such cold with those big gloves”

“that it is really important to use your gloves because the extreme cold might mean bits of your body fell off”

There were also comments from visitors in response to this question and others about the volunteers themselves. Visitors really seemed to appreciate the way the volunteers interacted with them and the personal touch this brought.

Most of the visitors were unaware that they had interacted with a volunteer and this area was not highlighted during the interview.

“That gentleman. He was such a sweetie. He was so patient...when he said he didn’t know the answer to one of their questions he took time to look up the answer. It was great”

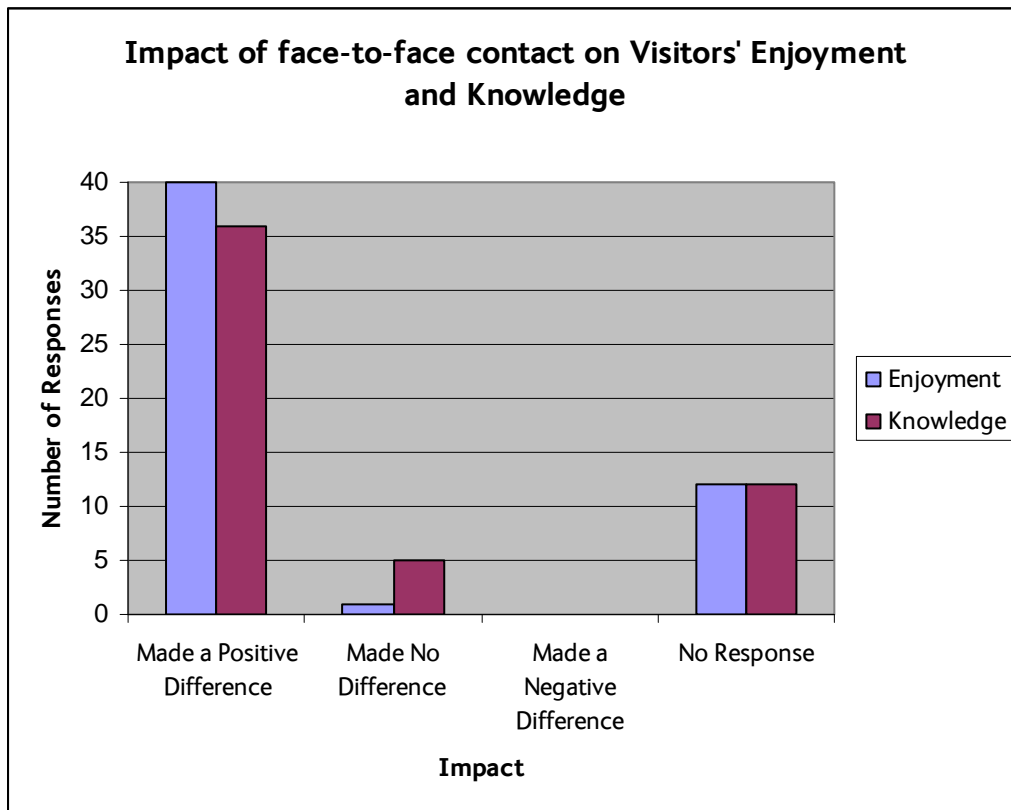
“Just how nice he was – we had a lovely chat”

6.4 Impact of face to face interactions

Visitors were asked to rate the impact of their face to face contact on their visit to Ice Station Antarctica.

As shown in the chart below, the vast majority of visitors felt that the facilitator made a positive impact on their visit both in terms of both increasing their knowledge and their enjoyment of the exhibition.

Figure 25: Impact of face to face contact in visitors' enjoyment and knowledge



Visitors had many reasons why the volunteers had made a positive impact on their visit including both the approach taken to the interaction, the content and the volunteers themselves.

“we got to ask questions”

“being asked questions makes you learn more [than reading text]”

“they made the space more lively”

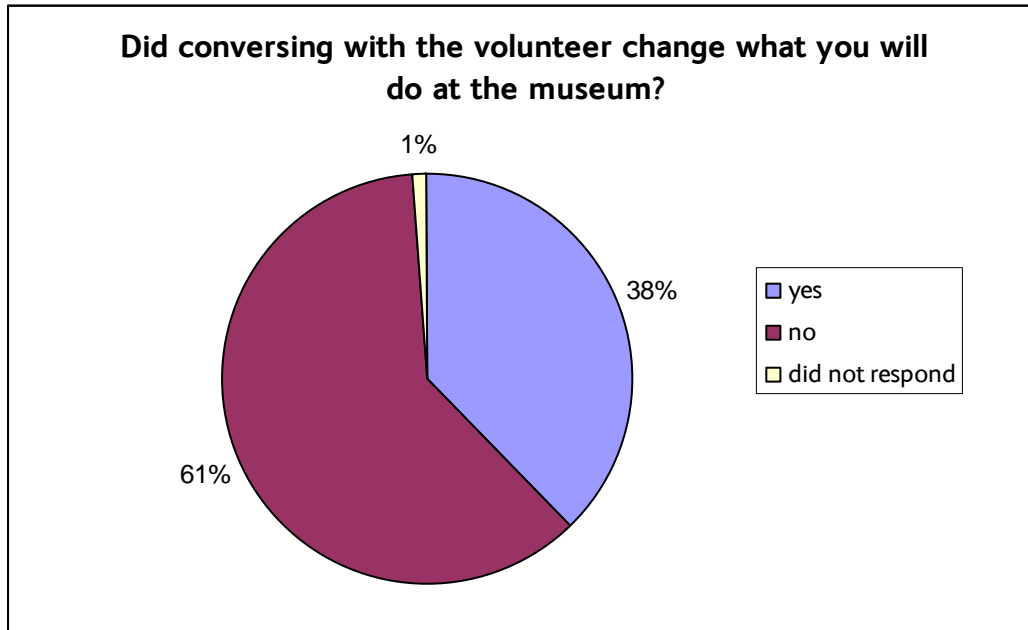
“the volunteer’s talks were tailored to the children’s level”

“gave things a personal touch”

Visitors were asked if they would do anything differently as a result of their face to face interaction.

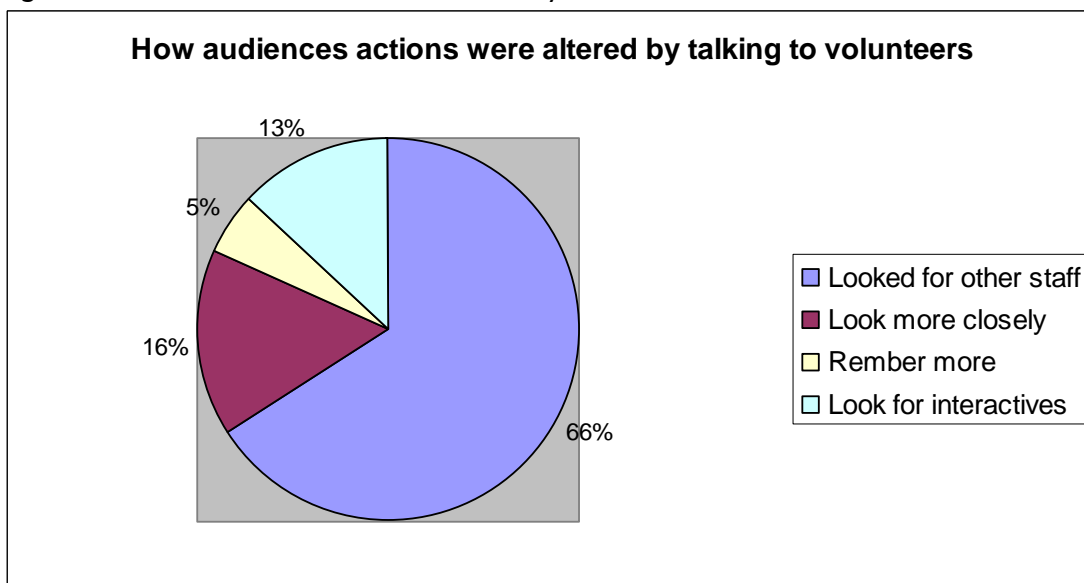
Most visitors responded that they would not do anything differently in the Museum

Figure 26: Would visitors do anything differently as a result of their interaction?



Those visitors who responded that they would use the Museum differently were asked in what way they felt that they would do so.

Figure 27: What visitors would do differently as a result of their interaction.



It can be seen in the pie chart above that most visitors mentioned that they would look for more staff to have a face to face interaction with. This shows that the visitors really valued their experience and wanted to engage with more facilitators.

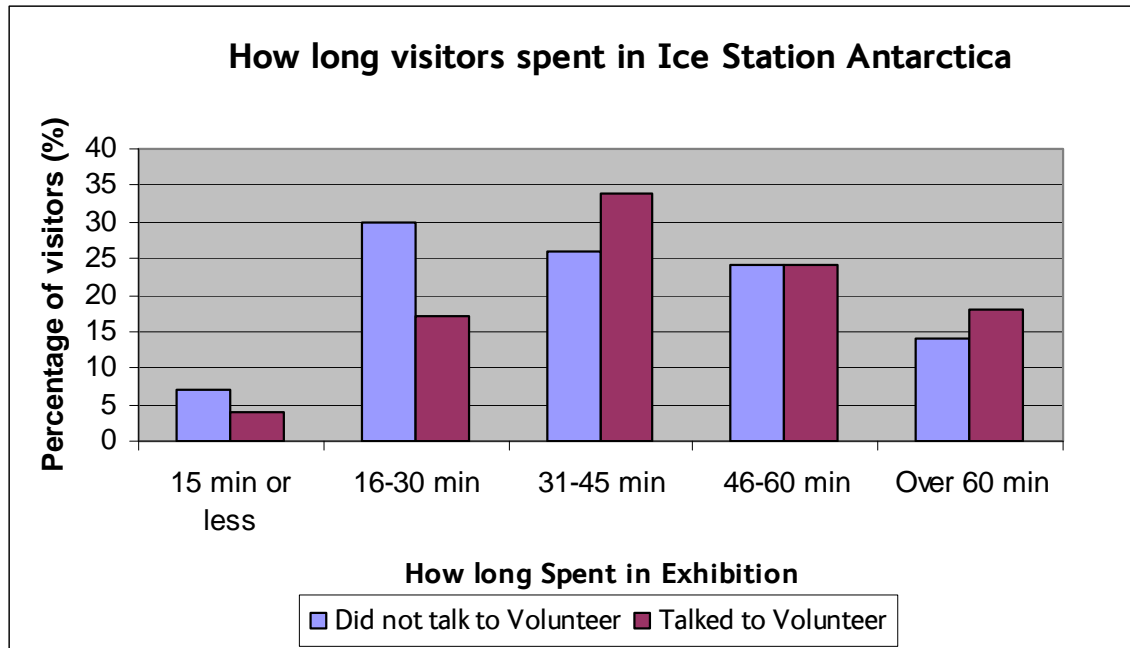
In terms of increases in learning, a minority of visitors (16%) mentioned that they would now look more closely at specimens and objects in the Museum. A further 5% felt that they would remember more.

6.5 Dwell time

Visitors were asked approximately how long they had spent in Ice Station Antarctica to find out if interacting with the volunteers increased dwell time.

It can be seen in the chart below that most visitors' estimations fitted in well with the actual dwell times from the visitor tracking.

Figure 28: Dwell time in Ice Station Antarctica

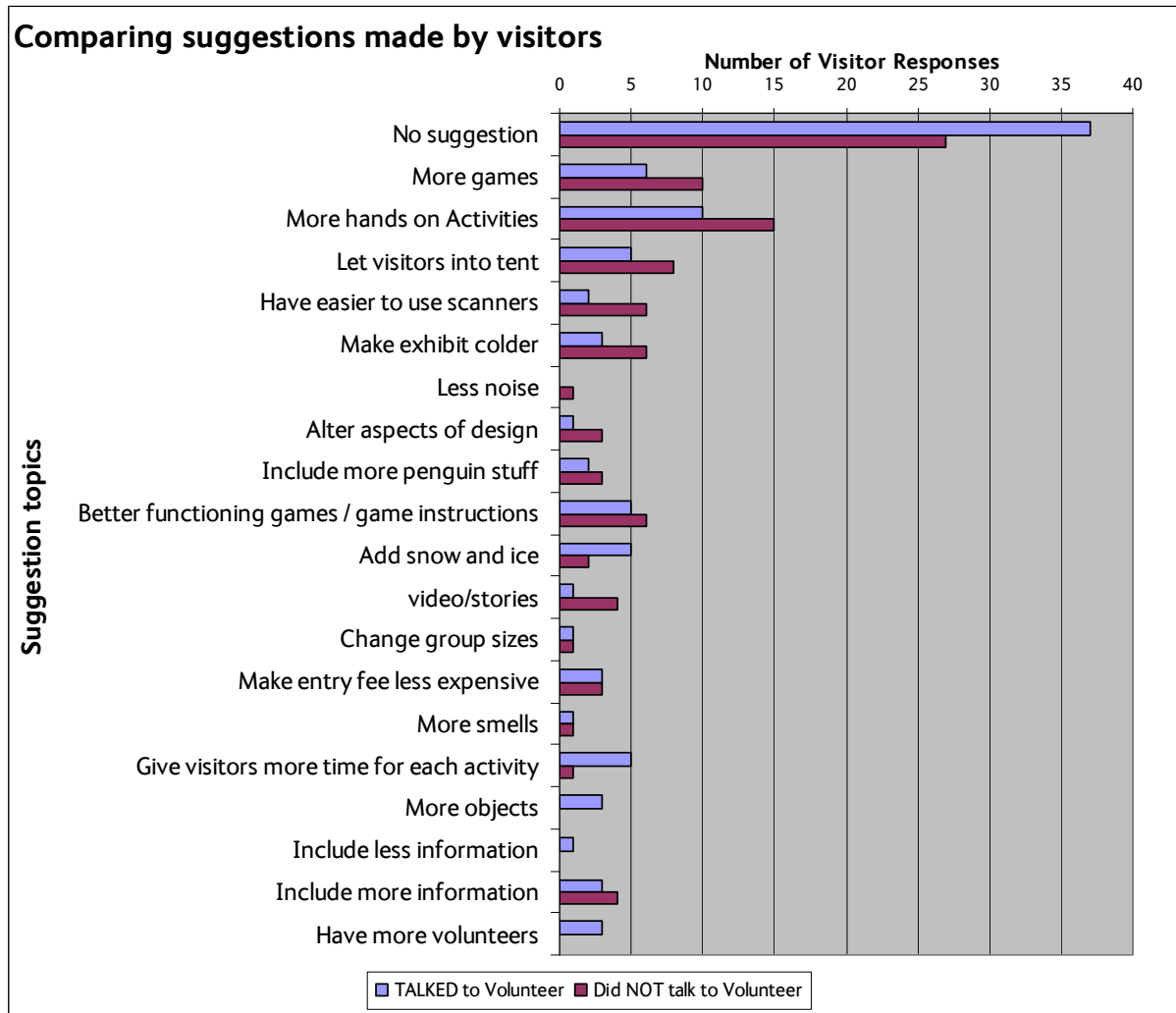


The chart above shows that visitors who had a face to face interaction were more likely to stay longer in Ice station Antarctica than those who did not. Visitors who did not interact with the volunteers were more likely to exit within 30 minutes.

6.6 Improvements

Visitors were asked how they thought Ice Station Antarctica could be improved.

Figure 29: How visitors thought Ice Station Antarctica could be improved



The chart above shows that while all visitors made similar comments about improvements those who had a face to face interaction were less likely to mention problems with the barcode scanners and less likely to request more hands on activities. They were also less likely to ask for more information and more games. This shows that the volunteers did enhance visitors experience within the exhibition even in areas they were not directly related to.

The data clearly shows that face to face interactions with a facilitator did have a positive impact on visitors experience and learning.

7. Appendices: Volunteer exit survey and tracking plan of the exhibition

Ice Station Antarctica Exit Survey

Vol present.....
 Vol not present.....
 Approx time.....
 Day type.....

Hello, my name is ... and I work here at the Museum. We would like to find out about your experience of Ice Station Antarctica. Would you have 5 minutes to take part?

1. What have you found most memorable about your visit today?

2. Was there anything in the exhibition that surprised you?

If a volunteer day

3a. Did you speak to anyone in a green T-shirt? Yes No

If yes

3b. What happened during your conversation?

4. What do you think you will remember most about the activity you did or the conversation you had?

5a. Could you rate the face-to-face contact in relation to your visit to Ice Station Antarctica?

	Made a negative difference	Made no difference	Made a positive difference
Enjoyment			
Knowledge			

5b. Why is that?

6a. Do you think that you have done or will do anything differently in the Museum as a result of your conversation?

Yes No

6b. If yes, what

7. How long have you spent in Ice Station Antarctica?

15 minutes or less	
16-30 minutes	
31-45 minutes	
46-60 minutes	
Over 60 minutes	

8. How do you think we could make Ice Station Antarctica better?

9. Finally, can I ask which age categories you and your group/family fall into. Circle around which person answered the questions

	Under 5	5-11	12-15	16-17	18-24	25-34	35-44	45-59	60+
Male									
Female									

10. Any other comments?

