

FINDING EVIDENCE OF VISITOR LEARNING

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Learning has many different meanings, interpretations and ways of researching it. In museums, in particular, measuring learning outcomes has become an important and significant way of showing to a variety of stakeholders, including funding bodies, that public learning as a key goal for museums is both achievable and measurable.

In looking at measuring learning in a museum we need to think broadly – not just at individual or group learning outcomes but as a big goal for the museum in all the public work that it does. Increasing public learning is one of the many ways that museums contribute to society.

When talking about measuring a museum’s success Stephen Weil (1994)¹ encourages us all to ask the question:

...what difference did it make that your museum was there?

According to Weil many museums have only vague goals with little that would be seen as measurable objectives, both for those outside the institution looking in at the outcomes, and most particularly for those inside museums, such as evaluators, educators, managers and others who are charged with the responsibility of measuring and reporting on these. Learning objectives are often couched in vague terms with goals such as “increasing understanding” identified rather than defining measurable outcomes for the visitor.

What is it that we are measuring?

For me, the most useful ways of defining learning as a measurable outcome are based on the work of Roschelle (1995)², Falk and Dierking (1997)³ and Weil. In this model learning:

- is the process of applying prior knowledge to new experiences
- proceeds primarily from prior knowledge and secondarily from presented materials
- is a complex series of interactions and feedback loops
- includes remembering and therefore memory
- is intimately connected to feelings and emotions
- is long-term: a continuous process of reconstructing experience

For museums I like to define learning in it’s broadest sense as *making some difference in peoples’ lives* – or in the words of the Australian Museum’s corporate plan – exciting visitors’ minds!

In this presentation I will discuss:

- methods used to measure learning in educational research and museum visitor research
- evidence found for visitor learning in a number of studies conducted at the Australian Museum

- what the evidence tells us about the conditions that may help increase the likelihood of visitor learning

In doing so I would like to demonstrate the important place that visitor research and evaluation has in any museum and the benefits of putting resources into these programs for measuring the museum's success with the public out there, as well as how *we* as museum professionals are learning in here.

How do we measure learning?

The two predominant movements in educational and social research are that of 'positivism' (or the scientific/empirical method) and what is called "interpretive research". The differences in these approaches are often seen based on different underlying epistemologies or world views about what constitutes knowledge and how best to 'test' it. This has been transferred into debates about quantitative versus qualitative research methodologies.

The positivist approach using quantitative methods has a long history in both museum visitor research and education research generally. The earliest visitor studies were undertaken in 1916 by Benjamin Gilman who looked at the issue of 'museum fatigue'. From this point on museum visitor studies grew as a field, with more resources devoted to finding answers to important questions about whether museums were fulfilling their missions of 'education for the masses' – the publics they were set up to serve.

To date most educational research has used and continues to be based in a scientific epistemology: research is largely experimental and based on hypothesis testing of relationships between a set or sets of variables, of which some are manipulated in experimental settings. Quantitative, or 'scientific' methods came to be widely recognised and viewed as not the only way to measure visitor educational outcomes but certainly as the predominant and accepted way of measuring learning. Examples of this were studies that looked at the effectiveness of exhibits in educational terms, studying visitor behaviour at and around exhibits, as well as trying to reach some understanding about who does and doesn't visit museums and why.

Quantitative research is usually based on larger sample sizes, often involves structured surveys or questionnaires, whether by interview, mail, self-complete, telephone or even web-based surveys, as well as experimental studies with control groups and so on. Because this type of research is good at providing facts, figures and statistical information it was and still remains the predominant paradigm for conducting educational and museum visitor research. Many of the most quoted texts and articles that describe learning outcomes, even the most recent ones I used in preparing for this paper, are still very much based in the scientific way of looking at the world.

However, quantitative research does have some value. For example in:

- giving us statistical measures – some people (especially Museum scientists) like this!
- testing for measurable differences between characteristics of a sample (e.g. age, social group, visiting patterns)
- extrapolating information and results to the broader population
- collecting trend data over time and across different programs/projects

The major problem is that quantitative research doesn't give us a good understanding into the reasons *why* people make certain choices or behave in the ways that they do. By being embedded in a scientific paradigm quantitative research is less flexible in its approach. For example, we could not change questioning mid-stream or divert off

our chosen path to explore other possibilities with visitors/respondents – that wouldn't be scientifically valid.

On the other hand, qualitative research comes from the branch of educational or social research that takes an interpretive approach to knowledge. It replaces the scientific approach of prediction, control and explanation with interpretive notions of understanding, meaning and action (Carr and Kemmis, 1986⁴). In a museum learning context this approach places emphasis on visitors' own recounts of their experiences and the subsequent meanings they have made from them. The role of the researcher and the purposes, intention and actions of those being researched become of prime importance. In museum visitor studies this approach has included methodologies such as in-depth interviews, observations, case studies, 'naturalistic' evaluations, ethnography and other studies of visitor meaning making and behaviour. The focus group as a qualitative technique has been one of the more predominant forms of interpretive research to date in museums.

The advantages of undertaking qualitative research are that it allows us to obtain insights into meanings that people make of their museum experiences – in their own words - with lots of rich data that can be used to illustrate points about the research outcomes.

In focus group research for example, being in a group situation mirrors how people make decisions and learn in real life. These are not made in isolation. Many of us operate within a social group that negotiates and discuss leisure choices and then 'deconstructs' the experience later.

Qualitative research usually allows the researcher to use lots of stimulus material that gives people something to respond to; helps explore further possibilities as well as testing the limits of what people find acceptable. Often with a focus group for example the researcher speaks directly to the target audience which allows the group commissioning the research to get very close to who it is they are doing their programs for.

In debates about which methodologies give the 'best' results, and there are many in this institution as I'm sure there are in yours, the best way to research and evaluate visitor learning is to firstly be very clear about what is to be achieved by the research, and secondly to determine a number of different ways to collect the information, given the limits of time and budget of course! This is called 'triangulation'.

Triangulation as a technique in social research is one way to overcome the nexus between quantitative and qualitative research (Cohen and Manion, 1994⁵). Triangulation simply means using two or more ways of collecting data about the same research question. In museum visitor research it could be a tracking study coupled with an exit survey and a longer-term follow-up study, or a set of structured observations, coupled with video footage of exhibit use and interviews with visitors. Triangulation uncovers the rich and complex outcomes as well as following an approach to research that focuses on interpreting meaning of actions, behaviours and outcomes for visitors in their terms.

To evaluate learning therefore we need to:

- Look for short-term outcomes: what were the memorable learning events for the visitor?
 - As well as studying the long-term effects – did we make a difference?
 - In a variety of ways that help answer the question – what evidence did we find that points to visitor learning?

At the Australian Museum we try to do this as much as possible and the studies I will outline will show you a variety of ways we have looked at visitor learning.

What evidence have we found for visitor learning?

How can learning ever take place when there is evidence that exhibitions are used in the following way (Hein, 1998⁶):

- visitors spend little time at individual exhibit components
- visitors seldom read labels
- visitors usually stop at less than half of the exhibition components
- they are more likely to use trial and error methods rather than written instructions in working out how to use interactives
- children are more likely to engage with interactive exhibits than adults
- attention to exhibits decreases sharply after about half an hour

There is so much I could talk about! What I will do in the time available is look very broadly at some of the studies undertaken here at the Australian Museum to see whether we can find evidence of visitor learning. I have left many things out, but these are included in the written paper. I will look at three aspects: measuring short-term recall; uncovering long-term learning and finding out the value of museums as learning environments.

A. *Measuring short-term recall*

Exit surveys conducted immediately after a person has visited an exhibition is one area in museum visitor research that has been somewhat devalued as a way of testing learning outcomes. Through exit surveys we find out immediate reactions and responses from visitors about their experiences and possible learning. By imaginative use of questions and analysing results by cross-correlating data between identified groups some evidence can be found of visitor learning, at least in the short-term.

A number of different questions were used in studying whether the *Spiders!* exhibition (1998, an exhibition about the biology, behaviour and evaluation of arachnids) seemed to have any impact on the way visitors felt about spiders. In this visitors were asked whether the exhibition had changed their views about spiders. As well, a tracking study was also undertaken to see what exhibits were attractive to visitors.

55% of those surveyed said that the exhibition did change their initial views about spiders and 45% said that it did not. Those who replied yes (55 respondents) were then asked in what way their view had been changed.

34% said that they had learned new things which led to a change in views:

Not all are poisonous - quite harmless.

Not so concerned about spiders at home.

Learned a lot about their abilities - very impressed.

32% said they became more aware about spiders and respect them:

More aware of spiders in Australia - size especially.

More aware of what to be careful of.

11% became more interested:

More fascinated - but still scary!

11% said that although their view was changed they still dislike them:

Still hate them.

9% said they were less scared:

Know more about them - not so scared.

3% said they were more scared:

[I'm] more scared - child less scared.

We tried out a new type of questioning designed to gauge whether respondents could apply new information about spiders to another context based on what they may have seen in the exhibition: in this case a fictitious newspaper article. Responses were categorised and also further divided against results of the question that asked whether they changed their views about spiders. Visitors were asked to read the following newspaper clipping and asked how they would respond.

Figure 1: Newspaper article

FUNNEL WEB TRAUMA FAMILY TELLS

The Kyle family of Leura are recovering today after being terrorised by a funnelweb spider in the family home this morning.

Michael Kyle described his shock at finding the funnelweb on the laundry floor. "We feared for our lives and that of our Persian cat Miffy", said Mr Kyle. "We'll have pest control out here spraying the place as soon as possible", exclaimed Mrs Kyle. Peter Cooper of *Try, Squish, Fry Pest Control* said that the only safe funnelweb was a dead funnelweb. "I'm sure everyone would agree", he added.

29% of the sample stated that the report was an over-reaction and 17% that they didn't agree with it.

Interestingly 8% of the sample said that funnel-web venom does not affect cats so why worry about Miffy?! In the exhibition this information was only available from a video in section 3 of the exhibition, an exhibit that wasn't in the top 20 exhibits (from the tracking study) yet was in the most popular area of the exhibition – where the live funnel web spiders were. Of course they could have known this information prior to visiting but we'll never know!

As mentioned earlier this question was also divided between those who said the exhibition changed their views and those who didn't. The results showed that more respondents who said that they didn't change their views agreed with the article – this was the highest category of response for this group! Evidence of non-learning?! Or bloody-mindedness!

In an evaluation study undertaken for an installation at the Museum called *Thirst: reflections on water in Australia*⁷ visitors were asked a number of statements to reflect their level of increased knowledge, understanding and appreciation of water (one of the objectives for the program). In this qualitative study results showed that 97% of respondents agreed with the statement It was pleasant to be reminded and learn more and 94% with the statement I was reminded of some important issues. This suggests that for these visitors prior knowledge is a key factor in their experience.

The value of this qualitative study was the visitors' rich descriptions given immediately after their experience: the exhibition made them think, promoting further reflection that may lead to longer-term learning:

It's an exhibition on water in a conceptual way. It's not in your face. It's subtle. It looks in different ways, personal ways at the big picture. It really hits home.

It's unexpected. To see an art form in a museum. It's something I'll think about for awhile. Something I'll reflect on later.

A wonderful mood piece. Emotional. A real change of pace. Don't expect it to be flashy and be dazzled. You have to search in yourself, it's not all just presented to you.

Exit surveys can elicit much rich information and descriptions and in the absence of being able to collect other forms of data (and many particularly smaller museums and galleries are not able to do this) their worth should be recognised.

B. *Mapping visitor behaviour: tracking and timing studies*

Beverley Serrell, a US-based visitor researcher has argued that:

The essential and simplest data that can be collected about visitors is the time they spent paying attention to the exhibits during their visit.⁸

Tracking and timing studies allow us to look at not only how long a visitor spent in a particular exhibition, but also how many of the possible total exhibits they attended to. Serrell states:

The places where visitors stop most often are also among those frequently mentioned as most memorable. This relationship of between observations of visitor behaviour and the feedback received in exit interviews suggests that behaviours can be indicative of interest, engagement, and memory...Visitors do not have eyes in the backs of their heads, so if you do not see them paying attention, it is unlikely that learning is taking place.⁹

I won't have time here to go into further detail other than outline some conclusions based on her most recent work - a gathering of time data of 108 exhibitions from a variety of museums, including natural history, social history, zoos and aquaria and art museums.

Serrell concluded a number of things from her analysis which seem to be borne out by our own tracking studies:

- tracking and timing data suggest that visitors do what they want to do, regardless of the best efforts of exhibit planners to force a path
- visitors skip many elements, visiting on average only one third of them
- visitors spend much less time in exhibitions than we either think or would like to think – usually less than 20 minutes
- to hold visitors' attention and set up the ideal conditions for learning, we need to first attract their attention – by studying visitor behaviour we can see what seems to be working well and what features attract and hold visitors attention

C. *Uncovering long-term learning*

In a study conducted on the effects of school experiences on visitors' memories and subsequent learning Falk and Dierking (1997)¹⁰ argue that learning is essentially long-term. If we use the definition of learning outlined at the beginning of this paper, *making some difference in peoples lives*, measuring long-term effects seem to be the best way of finding evidence for visitor learning.

To date there have been few studies that attempt to address this issue. It is difficult for two reasons. Firstly, selecting the sample of respondents is a problem – whom do you choose and how do you recruit them? Secondly, as we don't really know what long-term effects relate directly to the museum visit it becomes difficult to definitively state whether it was the museum visit that contributed to the learning – it could be lots of things.

A useful set of ideas were proposed by a group looking at this issue as part of the Museum's Corporate Planning process in 1997. They suggested that there were a number of behaviours/indicators of the excited mind or measurable consequences of a museum visit:

- return visits to museum and other institutions
- lasting memories (perceptions, knowledge and understanding)
- actions taken (reading, discussing, lobbying)
- thoughts changed
- new ideas and skills
- new connections

A small-scale qualitative study was undertaken for the *Indigenous Australians* exhibition to see whether it had any effect on visitors' thoughts, perceptions and understandings about Indigenous people. Two focus groups were conducted with twenty visitors (adults and children) that had seen the exhibition three to six months previously. It was an exploratory, in-depth discussion to:

- seek visitor feedback about the exhibition in a more detailed way;
- see what aspects of the exhibition stuck in people's minds; and
- see whether the exhibition made any long-term difference to our visitors.

Participants were asked to write down the strongest images/thoughts/ideas that they had at the time of visiting. Many responses used emotional language based on vague'ish memories of their visit as shown on these two examples of participants' response sheets.

It was interesting to note that there were varying levels of knowledge about Indigenous issues within the group. Most of those aged 38-50 years were angry that they hadn't had access to knowledge of the real stories of Indigenous people when they went to school and this came through many times during the discussions. The children were the most confident in their perceived knowledge about Indigenous people.

All the information that follows strongly supports the premise that these visitors were able demonstrate long-term learning and that we had been able to make some difference in their lives!

Participants reported doing the following things after their visit:

- buying a book/Aboriginal diary
- purchasing Aboriginal artworks
- recommending the exhibition to others
- using the information in school projects
- bringing others in to see it
- returning to the exhibition
- thinking differently
- gaining more respect and understanding of Indigenous people

They said that the exhibition gave them a number of things detailed below.

- the full story that had previously been 'hidden' from them:
[talking about the stolen children] It wasn't that long ago and you think if it happened today. You wouldn't let it happen today. I was hurt by that because I grew up in this country as a young child and it was happening around me and I didn't know it was happening around me as a child. No, definitely. You look back and you think, I was a part of it, I wasn't a part of it, but I was a part of it.
- a new perspective on the problems of Indigenous people and respect for them:
I thought differently. I've met Aboriginal people...the ones I have met..and it didn't click with the way that, as a child, when you grew up and everything you heard [was negative] and then you see an exhibition like this, well then you see a lot more of the story...
- understanding the meanings behind the story and relating this to their own experiences:
I came again actually to have another look at the exhibition. What really struck me I think is a feeling of dispossession...and in a way there were many similarities to the Welsh people...the English of course came into and invaded Wales and took over half of the village houses and tribes and later on they actually banned the Welsh language from being spoken, so we have many similarities that I noticed going around.
- ability to think differently about Aboriginal people - beyond images portrayed by the media:
Every time you hear about Aboriginals they're either going to jail or fighting. [Now I'd] think why do they always show this type of story? Why don't they show the nice story?
- a way of connecting prior knowledge to new knowledge; remembering; feelings and emotions; long-term outcomes - learning!:
I've been interested [in Indigenous issues] for probably about six years. [When] I went to school it was Captain Cook who discovered Australia. I read the Fatal Shore and then I remember [my daughter] did a school project and I rang up Aboriginal Affairs and they sent me out this information which I read and then became appalled and shocked. Horrified, mortified. And then I saw the exhibition and had the same response to the photographs, the people in chains. I must say I was aware of that but it really coalesced those images in the Fatal Shore - just to see those photographs. I really couldn't walk past, I read the information, but those photographs, those people in chains. And I remember trying to get the family to go through it to show them these things.

There was one amazing story told by one of the participants, a Native American, who felt a great rapport with the exhibition's messages:

You know what I did. I went home and bought one of those shirts, an extra large men's flag shirt, and I went home and I made a dress out of it. I made a dress. So I have this mini Aboriginal dress, and it looks pretty nice, and I wear this dress on Bondi Beach where anything goes and I can not tell you the energy of the people and the way people respond. Unbelievable. Bondi Beach, you know, anything goes there. I thought I was going to get beaten up! Twice I wore this dress. It was incredible. That was my own little experiment.

D. Value of museum as learning environments: exciting visitors' minds

Measuring visitor outcomes becomes more than a learning question – it is a question about what value people attach to museums as learning environments and the reasons they visit in the first place – their ‘visiting agenda’ (Falk, Moussouri, and Coulson, 1998)¹¹.

How can we measure value of museum visiting? This is a huge question and one that cannot be dealt with here. However, what we are now doing in our research projects is to start standardising some of the questions that we ask in the focus groups we either conduct ourselves or get others to do for us. We are beginning to try and see how visitors describe a successful museum visit in their own words both in terms of learning and other aspects. What is it they *value* about a museum visit?

In a study undertaken in late 1998¹² we were looking at the Museum’s Forward Plan and what topic areas had the greatest potential to excite visitors’ minds and prompt them to visit us. The specific sample chosen for logistical reasons was parents with children aged 3-12 years, divided into 2 sub-groups – those who visited in the past 12 months, and what we call lapsed visitors, those who haven’t visited for over 2 years. As part of this project we asked the researcher to think about ways of finding out what people value about museums as learning environments – for all museums visited, not just the Australian Museum. Participants did not know until the very end of the discussion that it was this Museum who had commissioned the research.

This project yielded much rich information, not only about what parents valued about museums but about how they determine an exhibition has been ‘successful’ in their terms. Even though the question wasn’t specifically framed as ‘what do they learn from a museum visit’ as we wanted to see if this was spontaneously offered, the discussions and verbatim quotes almost always refer to learning. Some respondents talked about experiences they had had up to two years prior to the research study. This shows the robustness of museum memories: a factor that contributes to museum learning (Falk and Dierking, 1997).

Overall the study showed three ways that parents ‘value’ museums. Firstly, a museum visit provides children with an opportunity to learn in a different way:

- brings topics/concepts to life
- enhances the school/learning experience
- stimulates their imagination
- opens their minds to new ideas; the world around them; history and other cultures

...for kids they don’t want to be lectured, they don’t want it as if they’re going to school, its got to be fun.

I liked watching the real live spiders. I did. I could have just sat there for ages. (would have visited six months prior)

The Australian Museum and they had this huge praying mantis, I’ll never forget that, that was just brilliant, the kids just loved it. (almost 2 years prior to this study)

Secondly, this study found that apart from learning, parents consider a museum visit valuable in other ways:

- in creating/strengthening the relationship with their children, spending quality time together, sharing experiences and enabling parents to tune into what fascinates their kids
- as a good family day out, something all the family can enjoy
- it gets kids out of the house and away from the TV and computer!
- museums are a different form of entertainment and good value for money

I remember going once [to the Australian Museum] and there was this treasure hunt thing and that was fun to do because there was a lot of running around looking in things, trying things out and that gave us something to do together as well. (museum mysteries activity, 2 years prior to this study)

It would actually bring things to life better for them apart from just using the Net and Encarta or using a book or whatever from the library.

Finally, the parents were able to easily articulate when a museum visit has been a success in learning terms. At the time the children don't want to leave; they ask questions and they take their siblings to see certain displays. Afterwards they talk about it; look at the world in a different way, for example showing a greater appreciation for animals, history, etc and notice more about the world around them.

They learn stuff as well. They look at spiders all the time now in the garden. Even the three year old now will – we can't go anywhere without spotting something.

I know that it can be like a talking point around the dinner table instead of having the television going or something. It is quality time.

So just opening their minds that there is something more in the world than just the house and TV. Especially when you go to museums and they open the drawers and there is this collection of things.

I think it is just the comments they make say a month or two down the track. They have remembered. It hasn't gone in and out the other side.

I think it gets them thinking. They ask you questions. I like to hear the kids ask questions.

If they don't talk terribly much about it after then I'll go 'that was a flop'.

They're teaching themselves in their own way basically. They're actually zooming in on something that interests them rather than you saying look what about doing this, doing that. When you go to a museum there's so many different things you can look at and they're actually choosing the bits that interest them.

Using the evidence – what are some of the optimum conditions for learning?

From both the literature and our own research I am going to put my neck on the block and suggest ways under three categories that we could help enhance the visitor learning experience. Some are obvious and well known but are worth repeating, some are not and need further consideration.

Exhibition Topics

Topics that people find innately fascinating – they know enough to whet their appetites - seem to have the best chance at attracting visitors and therefore promoting learning.

Themes that cannot be easily experienced or explained except via exhibitions are more likely to be attractive to visitors. For example if they can see it somewhere else (say at the zoo or on TV) they are likely not to be interested in visiting a museum.

Topics that appeal on some emotional level to the visitor and have a connection with their prior knowledge and interests are more likely to enhance the learning experience than those that don't. Exhibitions must appeal to the *heart*, not just the mind.

Front-end evaluation: testing out visitors' interests, prior knowledge and understandings becomes critical in assisting in developing exhibitions that will encourage visitor learning.

Exhibition Design

Physical and conceptual layout is important: mental fatigue decreases opportunities for learning.

Paying attention to orientation and organisation of the exhibition as well as physical comfort is crucial – giving visitors an idea of what they are likely to see and experience and how long it might take with plenty of places to sit and relax.

Smaller-scale exhibitions are likely to be more thoroughly used than large exhibitions and therefore amenable to visitor learning.

For natural history museums live specimens and dioramas are attractive and memorable features of exhibitions with positive effects on learning.

Video and television seems to be an effective way for people to learn new information – television is an all-pervasive medium in today's society and is probably under-recognised in its learning power by museums.

Exhibition Interpretation

Exhibitions that have something for everyone, pay attention to the many ways that people learn and appeal to all senses increase the opportunities for visitor learning.

Visitors need control over their own experiences and learning: giving them choices is important.

Conclusion

As you have already heard today learning is a key concept for museums in the new millennium. Museum visitor research has shown that:

- people are naturally active lifelong learners (Roschelle, 1995);
 - people that value learning are more likely to visit museums (Falk, Moussouri and Coulson, 1998);
 - museum visits are memorable (Falk and Dierking, 1997); and
 - museums are places of learning.

Visitor studies and evaluation contributes to facilitating museum learning in a number of important ways:

- measuring learning outcomes for the visitors – in the short and long-term; and
- providing feedback about methods, techniques and processes which assist visitor learning.

In doing so visitor research also helps promote organisational learning through both the dissemination of this information to those working on programs and through the continuation of research to gain new insights into visitor learning.

In conclusion, the words of the management theorist and organisational learning guru Peter Senge inspire me about learning¹³:

Real learning gets to the heart of what it means to be human. Through learning we re-create ourselves. Through learning we become able to do something we were never able to do. Through learning we re-perceive the world and our relationship to it. Through learning we extend our capacity to create, to be part of the general process of life. There is within each of us a deep hunger for this type of learning. "[learning] is as fundamental to human beings as the sex drive".

And what could be better for museums than that!

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