

Student Learning in Museums: **what do we know?**



Report prepared for
The Sovereign Hill Museums Association

by Dr Lynda Kelly

Foreword

This paper summarises the literature relating to learning in museums, with particular reference to the learning experience and outcomes for students in school groups.

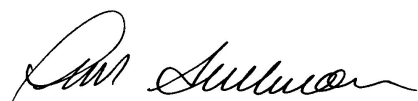
It includes reference to recent studies drawing on the thinking of students themselves and the attributes of enjoyable—and effective—learning experiences in museums.

The author, Lynda Kelly, is Head of the Australian Museum's Audience Research Centre, and has over the last decade been a leading researcher in learning and education experiences in museums. She has consulted widely in this field in Australia and for museums internationally as a consultant.

The report was commissioned by The Sovereign Hill Museums Association to refresh understandings of student learning in museums, and how it is the beginning of a lifelong engagement in learning.

Recent work in the development of a new Australian History curriculum and the way in which Australians engage with their history highlighted the importance of visits in the early years of schooling to museums, galleries, and historic places in encouraging students to learn about their heritage¹. To be effective players in achieving that goal, museums must be able to make the learning experience more personal and relevant to the learner, encourage exploration of big open questions, and which enables exchange of ideas with peers and experts.

The report will also be an important resource for advocacy in promoting an understanding of the impact of visits to cultural institutions as part of the school agenda.



Tim Sullivan
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¹ Paula Hamilton and Paul Nash, 'At home with the past: initial findings from the survey', *Australian Cultural History*, Vol. 22, 2003; Tony Taylor, *The Future of the Past: final report of the national inquiry into school history*, Monash University, Melbourne, 2000; Anna Clark, *History's Children: history wars in the classroom*, UNSW Press, Sydney, 2008; and 'History's Children', *Perspective*, ABC Radio National, 18 March 2008; Tim Sullivan, 'History in the new millennium or problems with history?', in *Understanding Museums: Australian museums and museology*, D. J. G. Griffin and L. Paroissien (eds), National Museum of Australia, 2011, published online at nma.gov.au/research/understanding-museums/TSullivan_2011.html

STUDENT LEARNING IN MUSEUMS: WHAT DO WE KNOW?

“In our conclusion the Museum is a great learning environment but with a few touch ups every now and then it would be excellent” (Participant, 2003 Kids’ College, Kelly and Groundwater-Smith, 2009)

INTRODUCTION TO MUSEUMS

A large range of people visit museums²: from the very young to the very old; and across different groups: families, friends, schools, couples. Museums are exciting places for visitors as they tell stories about the objects they hold and the research they undertake in a variety of ways. Museums are unique contexts for learning, often called “free-choice” learning environments. Museums have the opportunity to shape identities—through access to objects, information and knowledge visitors can see themselves and their culture reflected in ways that encourage new connections, meaning making and learning (Kelly, 2007).

Museums now operate across three spheres: their physical site; online (via websites and social media) and in the mobile world. Museums will always have physical sites – collections are fundamental to their very being. However, all trends point to the growing use of the web and social media in communicating, networking, building community and sourcing information. As well, mobile continues to increase as more and more people have smartphones and are using them to connect with museum content (see for example Burnette, et al 2011). The emergence of Web 2.0 now means that individuals have more control over how, where and when they learn and consult a wide range of information sources in their own time and space (Kelly and Russo 2010). This means that old models of teaching are no longer sufficient. As Cornu (2004) has observed in relation to schools, knowledge is now networked and requires an understanding of a collective intelligence over and above individual enterprise. The internet, and more specifically Web 2.0 has opened up a whole new way of engaging audiences, specifically educational audiences, who are taking up these tools in droves.

² For the purpose of this report the term “museum” covers cultural institutions including natural history and social history museums, science centres, historic sites and houses, as well as art galleries, that have public programs and exhibitions that are physically visited by a variety of people. They also offer online resources and mobile sites/programs.

Increasingly, museum visitors expect to be able to work, learn, study, and connect with their social networks in all places and at all times using whichever device they choose.” (Johnson et al, 2010).

In 2010 the Marcus Institute for Digital Education in the Arts (MIDEA), the museum-focused branch of the New Media Consortium (NMC), released the Museum Edition of the Horizons Report that considered technology use in museum settings. The report identifies and described emerging technologies likely to have a significant impact on museum education and interpretation in the next one to five years. The four key trends identified include rich media; digitisation; connecting with content from wherever the person happens to be and open content/social media³.

MUSEUMS, LEARNING AND EDUCATIONAL AUDIENCES

“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.” (Senge, 1992)

Learning is an individual and social process that humans are constantly engaged in, both consciously and unconsciously. Dewey (1938) suggested that learning was:

- the capacity to act intelligently in new situations through exercising personal judgment
- the interplay and interaction of objective (external) and internal factors
- a transition between individuals and their current environment
- a lifelong process of growth
- social—a shared common experience
- flexible, yet directed.

One of the earliest, and still the most useful, constructions of museum learning is the contextual model of museum learning proposed by Falk and Dierking (1992, 2000). This model recognises that museum learning takes place across three contexts: physical, personal and social. The *physical context* consists of the tools and settings of the museum, including architecture, design, objects and subsequent reinforcing events and experiences outside the museum. The *personal context* includes motivations and expectations, prior knowledge, experience and beliefs, interests, choice and control; as well as how these are perceived, filtered and ultimately incorporated into memory and learning. The *social context* accounts for the construction of knowledge via within-group mediation, facilitated mediation by others and cultural mediation.

³ For a list of blog posts summarising the Horizons work see the reference list at the end of this report.

STUDENT LEARNING IN MUSEUMS

“It has been like a treasure hunt. You have to find out information if you are to succeed. In the same way we have been following clues that we have got from our teachers and the people from the Museum, and in the end you get the glory and the gold” (Participant, 2008 Kids’ College, Groundwater-Smith and Kelly, 2010)

It has long been recognised that museums are educational institutions and that their school audiences are critical in both sustaining visitation and, through offering a positive and inspiring experience, can influence lifelong museum visiting habits (Falk and Dierking, 1997). This report outlines the evidence for student learning in museums under the frame of the contextual model of museum learning (Falk and Dierking, 1992, 2000), coupled with review of published studies primarily drawn from the work of DeWitt and Storksdieck (2008) and Groundwater-Smith and Kelly (2003-2011)⁴. Given the parameters of this review, the focus is on the physical museum space, coupled with the role of the teacher and museum staff. For more information about the impacts of the online and mobile spaces on educational activities see the list of resources at the end of this report.

The Personal Context and Student Learning

Field trips offer deep cognitive learning beyond facts and concepts to include process skills and draw on other places of learning such as museums. Learning on a field trip is a valuable supplement and addition to classroom instruction and a way to prepare students for future learning (DeWitt and Storksdieck, 2008).

Students are more likely to remember social and personally relevant aspects of field trips, yet also dislike and keep less favorable memories of these trips that seem overly structured and leave little room for their personal visit agenda (DeWitt and Storksdieck, 2008).

Based on the elaborateness of childrens’ descriptions it was concluded that high personal involvement, links with the curriculum and multiple visits to the same institution embraced long-term learning impact (DeWitt and Storksdieck, 2008; Wolins et al, 1992).

Affective outcomes, such as increased motivation or interest, sparking curiosity or improved attitudes towards a topic, may be more reasonable given the short-term nature of field trips (DeWitt and Storksdieck, 2008).

Visits to science centres can positively impact attitudes towards science for students who are already interested in and engaged with science (Jarvis and Pell, 2005).

Students felt that in order to be substantively engaged in cognitive learning they needed to: know how things worked; be able to think through ideas; have opportunities to ask questions; be able to handle, manipulate and closely examine artefacts and exhibits; be able to seek out information from several sources in language that is appropriate to their age and stage of development; and be stimulated through all their senses (Kelly and Groundwater-Smith, 2009).

⁴ Background to the work of Groundwater-Smith and Kelly (2003-2011) can be found here: <http://web1.australianmuseum.net.au/blogpost/Teacher-Talk/The-Coalition-of-Knowledge-Building-Schools>

When looking at emotional learning, students expressed a desire to be emotionally connected, while at the same time not emotionally confronted. The students in this study indicated that they welcomed opportunities to be fully engaged with provocative questions, fascinating and puzzling exhibits and clear, well-structured and accessible information (Kelly and Groundwater-Smith, 2009).

In the majority of cases the aspect of the field trip that was recalled subsequently was the content and/or subject matter presented during the field trip (Falk and Dierking, 1997).

Even after years had elapsed, nearly 100% of the individuals interviewed could relate at least one thing they learned during an early-elementary-school field trip, and most could relate three or more things (Falk and Dierking, 1997). Students retained information about sharks from an exhibition in a marine park in Italy up to three months after a visit (Miglietta et al, 2008). Sixteen months after visiting a science centre in Israel students recalled facts and details of their visit such as exhibitions, activities and guides' input (Bamberger and Tal, 2008).

The Social Context and Student Learning

Students are more likely to remember social aspects of their visit. The social interaction occurring on a field trip is an important part of the experience and supporting students' in sharing their experiences enhances learning (DeWitt and Storksdieck, 2008; Kelly and Groundwater-Smith, 2009).

Students like learning with their friends. While they recognised that a visit to the Museum was primarily designed by their teachers to assist in their learning, they also wanted it to be a satisfying social occasion when they could learn with and from their peers (Kelly and Groundwater-Smith, 2009).

Visits are highly social experiences for students. A study of sixth graders stated that they had more control over their own learning when interacting with their peers rather than adults who tended towards control (Birney, 1988).

A study of student talk found that school visits to museums assisted in building relationships between students through cooperative interactions and discourse (DeWitt and Hohenstein, 2010).

The Physical Context and Student Learning

Students wanted to feel safe and comfortable and to move around readily unimpeded by a number of prohibitive signs. They also wanted areas to be well-lit and inviting and find physical spaces scaled to their ages and needs (Kelly and Groundwater-Smith, 2009).

The novelty of the setting may distract from students' conceptual learning if novelty is strong (DeWitt and Storksdieck, 2008).

The degree of structure of a field trip is the subject of much disagreement in the literature – how much should the experience be mediated and teacher/educator-led, and how much should be student-led, based on free-choice learning? DeWitt and Storksdieck (2008) identified several issues around structured visits:

- To maximise cognitive and affective outcomes field trips need to provide moderate amount of structure while still allowing for free exploration.
- Well-designed worksheets can be effective in promoting discovery-based enquiry if exposing students to a wide range of relevant information.
- Well-designed worksheets may tap into already available interpretive material thus extending the richness of information.
- The use of pre and post visit activities can enhance the cognitive and affective learning outcomes.
- In a museum setting structure experiences, such as guided tours, specific detailed tasks can increase cognitive learning but may dampen enthusiasm.
- Structure, including worksheets, may limit the ability for students to explore and engage with the unique aspects of the museum setting.

Based on a range of studies, McManus (1985) recommended that worksheets should be designed to encourage observation, allow time for observation, focus on objects not labels, be unambiguous about where to find information and encourage talk.

THE ROLE OF THE TEACHER

“... it is important to create learning and educational experiences in a fun environment. Children learn when they are happy and have hands on experiences to stimulate their curiosity, language and questioning skills. The Museum is a great learning tool without having to ‘prepare’ as much as we learn more facts and information from the displays” (Participant, 2009 Teachers’ College, Groundwater-Smith et al, 2009)

Teachers value museums as sources of rich learning and social experiences (DeWitt and Storksdieck, 2008; Falk and Dierking, 1997; Groundwater-Smith et al, 2009). Teachers’ agendas for the trip will influence their subsequent classroom practice (DeWitt and Storksdieck, 2008).

Research reveals that teachers have complex and comprehensive reasons for field trips, valuing these as learning and educational opportunities and as chances for social and affective learning (DeWitt and Storksdieck, 2008).

Teacher motivations for school trips include connecting with classroom curricular, providing a general learning experience, enhancing student motivation, exposure to new experiences, change in setting or routine and student enjoyment (Kisiel, 2005).

Students with teachers who were both enthusiastic about science and engaged in extensive follow-up activities expressed more positive attitudes towards science after their museum visit than students in other classes (Jarvis and Pell, 2005).

DeWitt and Storksdieck (2008) report that field trips are enhanced when the teacher:

- Becomes familiar with the setting before the trip.
- Orients students to the setting and agenda and clarify learning goals.
- Plan pre-visit activities aligned with curriculum goals.
- Allow students time to discover and explore during visit.
- Plan activities that support both the curriculum and account for the uniqueness of the setting.
- Plan and conduct post-visit activities to reinforce the trip and enable students to reflect on their experiences.

Comments from Teachers' College participants (Groundwater-Smith et al, 2009) revealed a mixed response to structured visits:

- *"To some extent [preparation] can be done, but without destroying the thrill of visiting the Museum; it will vary with the stage level."*
- *"To maximise the learning of the students, you have to prepare the students in advance."*
- *"I would always include a visit as part of a unit of work, also it would depend on the purpose of the visit – to introduce students to an idea of consolidating learning."*
- *"I feel this is important but there are always unexpected outcomes. I always come to the Museum before a visit and make up a quiz for the class to do."*
- *"Prior preparation has an enormous value to engage them [the students] with the context of learning, using meta-language so that they can feel comfortable with the ideas and concepts displayed."*
- *"In relation to early preparation, whilst important for the smooth running of a visit is not a high priority. I prefer to follow the children's leads and spend more time in areas where they are very engaged and this can only be gauged when moving around the museum."*
- *"There can be too much preparation and students begin to make assumptions about the Museum before they get there. Sometimes being unaware of what is going to happen allows for an element of surprise."*

THE ROLE OF THE MUSEUM AND MUSEUM EDUCATORS

“Education is the key and the museum is a real and concrete way of making education relevant. Providing the opportunity of working with teachers collaboratively is real education.” (Participant, Teachers’ College, Kelly and Fitzgerald, 2011).

Limited research has been undertaken into the role of museum educators in school visit and researchers are only beginning to examine the role of the museum in the student visit (Griffin, 2004). However, of the literature consulted it is clear that collaboration between teachers and museum educators and other staff in program development brings positive results in terms of enhanced outcomes of student visits and in strengthening relationships.

DeWitt and Storksdieck (2008) report that teachers’ goals may not be the same as those of museum educators which, in turn, can cause confusion and impediments to learning. Teachers also may have multiple goals for the visit, whereas museums may be too focussed on the logistical aspects of the visit, such as wayfinding, parental consent, safety forms, transportation, financial transactions and orientation (DeWitt and Storksdieck, 2008).

When programs are developed in align with school curricular and teacher goals rather than the museum’s objectives, integration of the visit into classroom practice is more likely (Xanthoudaki, 1998).

Successful museum-school collaborations are often characterised by the museum reaching out to teachers and developing material in conjunction with them (DeWitt and Storksdieck, 2008; Groundwater-Smith et al, 2009).

Australian Museum staff who had participated in the 2009 Teachers’ College found this had a positive impact upon all participants, and that teachers had a great deal to offer in the way of advice. Staff felt that they had benefitted in terms of getting close to their audience; learning about how the Museum could better engage teachers and students; networking and connections made to enable further discussion and consultation to take place; and stimulating new ideas for programs (Kelly and Fitzgerald, 2011).

CONCLUSION

Overall, research reported by DeWitt and Storksdieck (2008) indicates that both cognitive and affective learning can occur as a result of class visits to out-of-school settings, but is influenced by:

- the structure of the trip
- setting novelty
- prior knowledge of students
- social context of the visit
- teacher agendas and actions on trip
- presence or absence of and quality of preparation and follow-up experiences.

In relation to the physical site, Groundwater-Smith and Kelly's body of work (2003-2011) concluded that the following design principles should be taken into account when developing exhibitions that will attract and engage young people:

- Establish coherent goals and aims.
- Identify the necessary knowledge domains and skills required to derive maximum benefit.
- Provide conditions that give the learner an opportunity to explain, inquire, interpret, apply and connect at a variety of levels and in enjoyable ways.
- Look for ways of attracting and holding interest.
- Differentiate to allow for varying experiences and abilities.
- Engage young people in deep knowledge and understanding that requires of them higher order thinking.
- Facilitate active meaning making by going beyond simply telling.
- Support varying levels of interaction with exhibits, including hands-on experiences.
- Provide conditions for learner discovery.
- Provide social support by treating all participants with dignity and respect.
- Render museum practices visible.
- Be alert to feedback.
- Enable young people to make an ongoing contribution.

FINAL SUMMARY THOUGHTS

Learning is the process of applying prior knowledge and experience to new experiences; this effort is normally played out within a physical context and is mediated in the actions of other individuals. In addition, learning always involves some element of emotion and feeling. Reflecting on the outcomes of this review it is concluded that designing engaging physical, online and mobile museum experiences for young people need to include the following elements:

- **experiences** that encourage discovery, interaction, cater for the unexpected, provide many pathways to explore, give a taste for what happens behind-the-scenes and are fun
- **content** that is challenging, real, authoritative, meaningful, encourages questions and is well-organised and easy to navigate
- **staff** that can relate to young people, are respectful of their ideas and views, are knowledgeable in their field and are easy to talk to
- opportunities to **socialise**, be with their friends and learn together.

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Australian Museum Online Resources

The Coalition of Knowledge Building Schools:

<http://web1.australianmuseum.net.au/blogpost/Teacher-Talk/The-Coalition-of-Knowledge-Building-Schools>

2010 Horizon Report Museum Edition: Commentary on the key drivers:

<http://web1.australianmuseum.net.au/BlogPost/Teacher-Talk/2010-Horizon-Report-Museum-Edition-Commentary-on-drivers>

2010 Horizon Report Museum Edition: Commentary on significant challenges:

<http://www.australianmuseum.net.au/BlogPost/Teacher-Talk/2010-Horizon-Report-Museum-Edition-Commentary-on-significant-challenges>

2010 Horizon Report Museum Edition: Commentary on technologies to watch:

<http://www.australianmuseum.net.au/BlogPost/Teacher-Talk/2010-Horizon-Report-Museum-Edition-Commentary-on-technologies-to-watch>

Learning Trends in an Online World:

<http://web1.australianmuseum.net.au/blogpost/Teacher-Talk/Learning-Trends-in-an-Online-World>

Web to Classroom Workshops:

<http://web1.australianmuseum.net.au/BlogPost/Audience-Research-Blog/Web-to-classroom-workshops>

How Would You Design An Exhibit Part 1:

<http://web1.australianmuseum.net.au/blogpost/Audience-Research-Blog/How-would-you-design-an-exhibit-Meeting-Part-1>

How Would You Design An Exhibit Part 2:

<http://web1.australianmuseum.net.au/blogpost/Audience-Research-Blog/How-would-you-design-an-exhibit-Meeting-Part-2-the-day>

e-Kids' College November 2007:

<http://web1.australianmuseum.net.au/blogpost/Audience-Research-Blog/e-Kids-College-November-2007>

Kids Talk About the Internet:

<http://web1.australianmuseum.net.au/blogpost/Audience-Research-Blog/Kids-talk-about-the-Internet>

Teaching the Facebook Generation:

<http://web1.australianmuseum.net.au/blogpost/Teacher-Talk/Teaching-the-Facebook-Generation>

Twitter in the Classroom Boosts Student Engagement:

<http://web1.australianmuseum.net.au/blogpost/Teacher-Talk/Twitter-in-the-classroom-boosts-student-engagement>