

## Review

# Learning in a museum. Building knowledge as a social activity.

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While the model for transmitting scientific information – a model that attributes the effects of a message on the public to the intent of the communicator mediated by text – is increasingly becoming an exclusive tool for communication novices, other alternative models are emerging and – most importantly – field research is being tested and examined. Research, in its turn, is born in particular theoretical cradles, seeking to give shape to initially convincing ideas, or providing greater information on observations that are still sporadic and cannot be generalised. This process takes place in all science communication sectors, and therefore also takes place in a museum environment, which is perhaps one of the richest original works.

A large number of studies, the majority of which stem from English-speaking countries, are showing that visitor experiences in museums – and thus learning – only depend partially on the display (and thus on the curator), while they are influenced by many other factors such as the identity of visitors, their motivation, expectations and previous knowledge and beliefs. And there is more: visitors cannot be considered to be isolated individuals, as they are always part of a group which may be present during the visit concretely (family, friends, class) or only virtually present (reference community), and their museum experience and learning is closely connected to what takes place within this group.

Using different methods (although, generally speaking, museum studies share them with social studies) on different samples and on different museums and activities, current research is seeking to identify some of these significant variables in greater detail: how to pinpoint and assess the visitor's level of motivation and its effects on the visit results; how to identify the visitors' agenda, that is to say expectations and organisation prior to the visit, and how this agenda determines the learning output; how to analyse that which can generally be called "learning in an informal context" into sub-components (acquisition of information, but also changes in attitude, emotions, proposed action, etc.) and how to measure it in visitors in the short and long term after the visit; what happens to the family group in the museum, and how exchanges within the group determine different levels of learning; and, lastly, what visitors talk about when they visit a museum and how they do so.<sup>1, 2, 3</sup>

Those who are particularly interested in investigating the specific nature of learning in a museum context are focusing their attention on conversations between visitors: research seems to indicate that it is from these conversations, although they are definitely informal, unorganised and, at a first glance, superficial, that understanding, interpretation and memorisation of the museum experience emerges. Learning is the result of group processing, rather than individual conclusions.

A book published recently in the United States<sup>4</sup> is entirely dedicated to presenting and discussing the results of research into this topic, which involved two researchers, Gaea Leinhardt and Karen Knutson, numerous assistants and five US museums.

### **The research context**

For at least three decades, special attention has been paid to informal learning and the places where this occurs (history, art and science museums, zoos, aquariums, botanical gardens, planetariums, etc.) in the United States. On the one hand, these institutions work on the non-expert adult public, otherwise difficult to reach; on the other, informal education provides powerful support to US schools, which are certainly not the best in the world. A complex programme of research into learning in museums, the

Museum Learning Collaborative (MLC), was launched in 1997 after winning national funding. It was the most widely funded study into this area in the US for several years.

Promoted by the Learning Research and Development Center at the University of Pittsburgh, the MLC began by sorting existing literature into an annotated online bibliography, then going on to organise research in order to generate “a research agenda – and in time, a body of researches – sufficiently broad and powerful to guide the study of learning in informal contexts”.<sup>5</sup>

Leinhardt and Knutson’s research focused on studying spontaneous conversations between visitors to five museums, of a deliberately different nature (the Carnegie Museum of Art and the Carnegie Museum of Natural History in Pittsburgh, the Conner Prairie in Fischers, the Henry Ford Museum and the Greenfield Village in Dearborn, and the Exploratorium in San Francisco). 7 exhibitions (temporary and permanent) were selected inside these museums and 30 groups of visitors were followed per exhibition. Visitors were interviewed once at the entrance to the exhibition, in order to assess the group’s prior knowledge, interest and expectations, and a second time at the end of the visit, in order to measure the changes. The interviewers also used images and cartoons with questions/stimulus for the second interview, in order to remind visitors of some of the subjects dealt with by the exhibition.

The really innovative research phase, however (although this was not the first or last study of this kind), was the recording and analysis of all conversations between visitors during the visit.

Not only does the book describe how the data was collected and analysed, it also reports the entire theoretical discussion that led the authors to make certain research decisions: definition of concepts, observation, quantification and assessment tools, etc.

### **Learning as social construction**

The authors based their work on a number of assumptions, which they call the “socio-cultural model”, according to which learning is influenced by a series of factors that can be grouped into three main categories: the ensemble and connection between the personal histories and identities of the visitors; the environment in which the visitors find themselves, that is to say the museum space with its collections and/or exhibitions; and lastly the explanatory engagement in which the visiting group members find themselves involved as a group.

“In the social-cultural way of looking at things, learning means less that an individual ‘owns’ certain knowledge- in the sense of having a valuable possession – and more that an individual can participate in a particular group or world in an active way.

Socio-cultural theory emphasizes the idea that meaning emerges in the interplay between individuals acting in social contexts and the mediators - tools, talk, activity structures, signs, and symbol systems - that exist in that context. Individuals both shape and are shaped by these mediators; a unique aspect of humans is our propensity to invent and to invent with the instruments of our own development”.

The two authors made a huge effort to define these three aspects (identity, context and explanatory engagement) as clearly as possible, making them observable and quantifiable. The conversations were also analysed in quantitative terms, thanks to a complex system of analysis, interpretation and categorisation.

In order to analyse the impact of the learning environment (exhibitions visited) on the visitors’ cognitive experience, the researchers proceeded as follows: the museum curators were interviewed at length and they worked together to identify some of the main themes, five per exhibition considered; as already mentioned, visitors were interviewed before and after the visit, in order to assess their interest and their background (at the beginning) and learning (at the end); spontaneous visitor conversations were recorded during the visit, also indicating the place in which they occurred, and thus the link between the themes discussed and the physical context; lastly, the conversations were analysed, drawing out (in this case) references to exhibits or features that the visitors found themselves next to in that precise moment, and references to the five themes felt to be the main ones in the exhibition in question. The more numerous these references were (with respect to personal observations, to the past or to personal interests, etc.) the greater the impact of the environment on the visitors’ experience. By combining the quantification of the impact with that of learning, and comparing this datum with that

coming from the other factors taken into consideration, the researchers measured the weight of the “learning environment” variable on the museum experience.

They dealt with the “identity” variable in the same way: the authors monitored individual differences, finding out whether the visitor had any professional connection with the subject of the exhibition during the pre-visit interview. They then analysed how much this interest or prior knowledge emerged in the recorded conversations during the exhibition interpretation process. This variable was also weighed against the other two.

Lastly, after the learning environment and individual identity, the researchers examined to what extent and how visitors got involved in understanding the experience. Different kinds of explanatory engagement emerged in the conversations. These were then grouped together and categorised in terms of “making lists” (i.e., naming objects), “personal synthesis” (that is to say connections made between that observed and one’s own individual world), “analysis” (comments of an analytical/descriptive type), “synthesis” (connections between objects and different phenomena), and lastly, “explanations” (answers to questions on mechanisms, processes, etc.). The various occurrences of these explanatory engagement categories were measured, then comparing this measurement to the other variables taken into consideration.

### Cooperation as a decisive factor in successful learning

The complete system for identifying variables, measuring them and analysing the data is too complex to be discussed in detail in this paper (for further information, please refer to the book). However, we feel that it is interesting to report on the most surprising result amongst the enormous quantity of data produced by this research.

While it is true to say that specific interest, educational background and the occasion on which people visit the museum are all aspects that are significantly related to learning, the factor that seems to determine success more than any other is the learning engagement of the subjects, that is to say how much time and with how much effort and collaboration the visitors converse and comment on what they see:

“Attributes of the group that reflect their identity affected learning. Design aspects of the exhibitions mediated learning. The more the museum designers made available intellectual and physical supports for the core ideas of the exhibitions and the more they were used, the more there was evidence of learning. Conversation was a cognitive tool for learning. When groups coordinated explanatory conversation that reflected the contents in a exhibition by analyzing its components, comparing or contrasting objects or activities, the more they seemed to learn. Conversational activity, as measured by explanatory engagement, was the most influential factor in learning”.

Amongst all the visitors observed, the highest score in terms of learning was thus received by two middle-aged ladies, who chatted amiably together, supporting each other with information and stimuli, without imposing themselves but supporting each other in giving meaning to what they saw, meaning that they were able to exploit the intellectual opportunities of the exhibition more than individuals with a greater prior interest or more competent visitors.

In order to give a taste of these museum conversations, which are so important even if seemingly so “superficial”, here is an example of a conversation in which the two friends discussed the different properties of aluminium:

“Woman 1 – I wonder how they made these statues. How they [reading] ... ‘Casting’. I guess just like any other metal. [pause] I just realized how little I know about aluminium! Like, does it conduct electricity? It must. I’m thinking, like would be safer-  
 Woman 2 - Yes, it does. No, it’s not.  
 Woman 1 - It takes more aluminium than copper, I think.  
 Woman 2 – Aluminium wire is thicker than the same grade of copper wire.  
 Woman 1 – If you’re sitting in your chair on the front porch and it’s steel or it’s aluminium, which one has the higher probability of getting struck by lightning? [laughs]  
 Woman 2 – I can’t answer that! [laughs]

Woman 1 – Because I was out on the front porch one day ...”.

### Conclusions and indications for the world of museums

The theoretical assumptions on which the two researchers based their work are interesting and difficult to contest, while their results (which confirm how interesting this model is) are significant. However, despite being decisively long, the book does not manage to reflect the wealth of the research results and is difficult to read.

This essentially happens for two reasons. In the first place, the book aims to act as a guide for future research in the same field, and wants to take the reader by the hand through the entire process (the “behind the scenes”) which shaped the research, providing a detailed discussion of the decisions that were made and the contemporary theoretical context, of which those decisions are personal interpretations. This theoretical discussion is very interesting, but perhaps rather muddled, and above all overshadows the actual investigation and steals material space away from the description of the results, that is to say the description of what really happens between people when visiting an exhibition. In many cases, it would perhaps have been more interesting to be able to read more conversations and see them discussed in greater depth.

Secondly, the authors made a great effort to convert this extremely qualitative subject (learning, identity, interaction!) into numbers and quantities. This was an extremely fascinating effort and certainly provides a reference point for further research in this area, but, once again, it offers the reader rather unclear numerical tables, while the discussion of the actual data and their significance in terms of the cultural debate on museums is not actually taken far enough.

It should be noted that this volume was preceded and exists alongside other publications by the same group of authors, some of which are more legible, and perhaps lacks some degree of self-sufficiency because of this.<sup>6, 7, 8</sup>

The working conclusions proposed by the researchers as suggestions for those working in museums are extremely intelligent and useful, and they move in the same direction as operators specialized in science communication inside museums and science centres are moving on their own.

While it is true that many factors that escape the museum curator’s control (interest, motivation, age, gender, background of the visitors, etc.) contribute to determining the museum experience, it is also true that curators, who have a better knowledge of these aspects, can work towards providing a more favourable context for the development of the peculiarities of this particular learning process.

Visitors, state Gaea Leinhardt and Karen Knutson, like to find written information and other material to use during their visit. This does not mean that it is necessary to set up exhibitions that are more like pages of a book hung on the walls than a display, but confirms (as other research has done before) that visitors use written information, even if they may seem not to, and it is necessary to plan the quality, quantity and design of the same very carefully. Visitors do not read all the material available to them scrupulously, but seek out what they need at a given moment, and are unhappy and frustrated if they are unable to find it. Textual resources provide fuel for conversation, and are used, recycled and related to other matters for that purpose. In this sense, if curators act in the right way, they will certainly be able to promote self-learning in their public.

The second indication is perhaps even more interesting than the first: visitors like it if the written information and resources bring up controversial questions and points of view that differ from each other or from the visitor’s point of view. This stimulates discussion even further and allows visitors to ask themselves what they think about a given problem.

“If the goal is to provoke, nurture, and support conversation in the museum environment, there is a need to have meaningful information for visitors, information that answers their questions. Visitors need to find information that address issues. Visitors seem to be interested in knowing the stance and role of curatorial interpretation. An aware public may misinterpret or find a particular interpretation not to their taste, and the ensuing controversy between visitor beliefs, agendas, and curatorial premises can threaten public support to museums. Yet to dumb-down material, neutralize a stance, or whitewash controversial aspects of the interpretation is not the answer. To the contrary, in cases where controversy of interpretation or controversy of content was put forward by the museum, we repeatedly saw visitor engagement and discussion”.

## Notes and references

- <sup>1</sup> J. H. Falk, T. Moussouri, D. Coulson, "The effect of Visitor's Agenda on Museum learning", *Curator*, 41(2), 1998, p. 107-120.
- <sup>2</sup> T. Moussouri, "Negotiated Agendas: Families in Science and Technology Museums", *International Journal of Technology Management*, 25(5), 2003, p. 477-489.
- <sup>3</sup> M. Barun, M. Chambers, A. Cleghorn, "Families are learning in science museum", *Curator*, 39 (2), June 1996.
- <sup>4</sup> G. Leinhardt, K. Knutson, *Listening in on museum conversations*, AltaMira Press, Walnut Creek, CA, 2004.
- <sup>5</sup> See also: <http://museumlearning.com>
- <sup>6</sup> K. Crowley, M. Jacobs, "Building Islands of Expertise in Everyday Family Activity". In: G. Leinhardt, K. Crowley, K. Knutson, *Learning Conversation in Museum*, Lawrence Erlbaum Associates, Mahwah, NJ, 2000.
- <sup>7</sup> J. Fienberg, G. Leinhardt, "Looking through the Glass. Reflections of Identity in Conversations at a History Museum", *Museum Learning Collaborative Technical Report*, #MLC-06. Also available at: <http://mlc.lrdc.pitt.edu/mlc>
- <sup>8</sup> G. Leinhardt, K. Crowley, "Objects of learning, Objects of Talk: Changing Minds in Museums". In: S. Paris, *Perspectives in Children's Object-Centered Learning*, Lawrence Erlbaum Associates, Mahwah, NJ, 2002.

## Author

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