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Learning from learning theory in museums

Eilean Hooper-Greenhill

Learning in museums has a long history. But how has learning theory been used in museums? This chapter discusses the poverty of use, and the failure to think of museum audiences as real people.

The use of educational theory at the Natural History Museum, London, is discussed and the path taken from a base in educational technology through to the realization of the active nature of the visitor is briefly described. This is placed within the context of the development of visitor studies as a whole.

The importance of the role of the museum educator in today's approach to exhibition development is emphasized. Many museum educators, at least in Britain, have a background in teaching either in schools or elsewhere. The experience of planning for real people in the classroom is a valuable one to apply within the museum, but it needs to be thought through carefully to be of the most use.

INTRODUCTION

Museums have long been thought of as educational institutions. A mid-nineteenth-century comment from the First Report of the Department of Practical Art, the government institution that originally ran the Victoria and Albert Museum, demonstrates this well:

> a Museum presents probably the only effectual means of educating the adult, who cannot be expected to go to school like the youth.
>
> (Hooper-Greenhill 1991: 18)

Lawrence Haward, curator of the Manchester City Art Galleries, speaking in 1917 at a Museums Association conference in Sheffield, drew attention to the educational possibilities of museums in teaching children. He said that visits to the galleries

> have the result of increasing the children's critical faculties and their capacity for self-expression. The children are . . . being made to think and feel for themselves.
>
> (Hooper-Greenhill 1991: 32)

So the idea of learning in museums is not new. However, it is my feeling that until fairly recently learning theory has been significantly used only in the education department of museums. Here, museum teachers have learnt how to adapt classroom teaching and adult education practices for the museum environment. At its best, this has been

an outstanding success. There are a range of approaches to learning and teaching that have been developed in the delivery of face-to-face teaching and learning sessions, including workshops, drama, role-play, problem-solving and so on. Without perhaps any rationalizing or thinking in grandly theoretical terms, practical methods of direct teaching have evolved.

What has been more problematic has been the use of learning theory in museum exhibitions. With the notable exception of the work at the Natural History Museum in London there appears to have been little thought given, in Britain, to how learning theory might improve exhibitions. Indeed, it is only recently that museums and galleries have begun to consider audience responses at all. Up until now, the process of exhibition production has not included a concrete picture of the users. The complex processes of object research, conservation, design and construction have taken on their own momentum, and although visitors have always theoretically been part of this process, the part played has been rhetorical and abstract, and the visitors themselves have remained mythical.

In terms of effective communication, this is very unreliable. There will be some success, mainly for those who understand and are interested in the story being told; or those who have prior knowledge of the content; or those who already know a little about the objects. It will be very unlikely that exhibitions planned in this way will excite those new to the subject; or those who want a sociable leisure experience in the museum; and it is even more unlikely that new audiences will be attracted. Ineffective communication leads to lack of interest, lack of attention, lack of excitement and no learning.

However, for a number of reasons, we now see a great deal of interest both in making museums more attractive to existing visitors and in developing new audiences.

So, how can learning theory help us to do this? What has been done so far?

THE ANTECEDENTS

The only museum to work systematically with educational theory in Britain has been the Natural History Museum in London. Here, a very interesting experiment was begun in the 1970s.

You will have noticed that I have stopped using the expression 'learning theory' and have used the broader term 'educational theory'. The work that was carried out at the Natural History Museum was more concerned with 'teaching theory' than with 'learning theory'.

Recognizing that most museum and gallery exhibitions had an educational component, and that exhibitions in science museums were concerned in a very large part with teaching, Miles and his team looked to current educational theory to help them develop more effective exhibitions, exhibitions that would teach better.

Miles argued that exhibitions should have justifiable and worthwhile objectives (Miles *et al*. 1988: 2), and that the uninformed visitor needed help (Miles *et al*. 1988: 3). Teaching, he argued, was about introducing the learner to higher-level relational thinking, showing the learner how facts were related and thereby explained causal links (Miles *et al*. 1988: 29). The model of teaching was essentially didactic and concerned with developing cognitive abilities. Intuition and affective education are not acknowledged. In this sense, the model was perhaps a creature of its time. Science

teaching was possibly one of the last areas to be moved by the progressive educational theories of the 1960s.

Although learners were acknowledged to be curious, and it was recognized that they needed to feel that the exhibition's teaching points were attainable, learning was less an adventure of self-discovery, and more a journey along a previously defined path. These learners were still mythical, unreal players in the museum exhibition game. Equally, they were to a greater or lesser degree 'uninformed' and thereby brought few resources with them into the museum. As the research progressed, discussions and evaluations revealed the importance of understanding the audience as real people.

Miles and his team looked towards educational technology as an appropriate educational theory to apply within exhibitions. They developed the concepts of behavioural objectives for exhibitions, so that exhibition teams could better define and describe what they were trying to do. They introduced the notion of the content of the exhibition delivered as a 'teaching sequence that builds up smoothly' (Miles *et al.* 1988: 31). At first they assumed that learning must take place in educational exhibitions through looking, although this looking would be made more effective if it were accompanied by the chance to 'do' things (Miles *et al.* 1988: 32). As the work continued, the approach became more interactive, more flexible and more informed by the agendas brought into the museum by visitors. The emphasis shifted from theories of how to teach, to the construction of opportunities to learn.

The main site of the debate over the work done in the Natural History Museum has not, to our shame, been in Britain, where the work has been largely ignored, but in North America, and particularly the United States. Here, it plays an important role in the struggle to develop the new museum discipline of Visitor Studies.

A second major use of educational theory, again in a science museum, can be seen in the Exploratorium, which was founded by Frank and Jackie Oppenheimer in San Francisco in 1969. The theories developed in this museum were much closer to 'learning theory'. A basic emphasis was on the empowerment of the visitor, where the role of the museum was to 'make it possible for people to believe they can understand the world around them' (Hein 1990: xv). This was a broad philosophical aim, held together with a conviction that the museum should be a place in which people could directly experience and manipulate things, rather than be told about them. The educational goal was self-liberation.

Again, visitors were recognized as curious, but this in itself was to be celebrated rather than controlled, and play, both in the spirit of enquiry and in the roaming of the imagination, was to be a guiding principle of the exhibits. A non-hierarchical teaching ideal was aimed for, where visitors helped themselves and each other to learn (Hein 1990: xviii), and where staff and visitors could learn together.

The Exploratorium rejected the dualism of art and science, and worked from the principle that science has an aesthetic dimension and art a cognitive one. Both art and science offer insights than can help develop our concepts of reality (Hein 1990: xvi). Thus in the museum, where work by artists stood alongside exhibits from experimental science, both cognitive and affective elements within understanding could be mobilized.

A major method of the museum was, and is, interactivity. The exhibits are participatory and depend upon the physical engagement of the visitor. To understand the world it is necessary to act upon it. The democratic philosophy of access to knowledge and ideas led to the development of ways to achieve this, using the medium of a science museum.

Interactivity, as we all know, has been enormously successful. However, initially the methods and their underpinning philosophies at the Exploratorium were seen as controversial and, certainly for most museums, not very relevant. Science centres were not regarded as 'proper' museums. However, the runaway box-office effects of hands-on exhibits have forced a reappraisal of this rather pious attitude.

Although in education departments we have known for a long time how popular the handling of exhibits and objects has been, it is only recently that we have seen the principles of interactivity beginning to be applied in art galleries, archaeology displays and history museums.

THE DEVELOPMENT OF VISITOR STUDIES

A common thread that links the diverse approaches of the Natural History Museum and the Exploratorium is the notion of evaluation. Both educational technology and interactivity demand evaluation to ensure effective exhibitions, and evaluation was indeed built into the development processes in both institutions. At the same time as the evaluation of exhibitions was emerging, external constraints pushed museums towards visitor surveys and market research. Summative evaluation (carried out when the exhibition was open to the public), soon led to the need for formative evaluation (testing of exhibits during production) and front-end evaluation (preliminary research to see if the idea for the exhibition was feasible in the first place). Preliminary research was also carried out to see how much people knew about the subject-matter of the proposed exhibition.

Soon evaluation and market research began to overlap. Clearly visitor surveys also somehow related. At the present time, we are witnessing the birth and very rapid development of something I mentioned earlier – Museum Visitor Studies. A recent volume of *Museum International* (no. 178) is entirely concerned with Museum Visitor Studies and demonstrates through overviews from Europe and North America how this is happening. Work in Visitor Studies is also going on in Scandinavia, Russia, Greece, Australia, New Zealand and India.

Visitor Studies is a hybrid discipline, drawing on theory from sociology, psychology, education, marketing, management, communication and leisure studies. It covers a huge range of material – demographics and other data on attendance and non-attendance; psychological and personality profiles of visitors (learning styles, attitudes, language skills and time-frames); patterns of visitor behaviour (who goes where, with whom, fatigue, return visits, use of services, preferences for types of exhibit); ability to understand exhibition messages (and the impact of the exhibition on attitudes, behaviour, interests); how the design and presentation of elements within museums and exhibitions such as signage, layout, media and noise affect reading behaviour, way-finding, attention. Finally Visitor Studies is concerned with the development of evaluation methods to assess learning, the short-term and long-term impact of the exhibition, social behaviour patterns, attendance and post-visit interests (Screven 1993: 6).

As you might expect, Visitor Studies as an approach is unequivocal about the necessity for gathering and using this kind of information. However, it goes further in stating that what is really required is a major shift in the system of exhibition production from curators/subject specialists and exhibit designers, to educators, instructional designers and evaluators. In the article introducing the issue of *Museum International* just mentioned, C. G. Screven proposes separating the object-based scholarly work

of curators, which elaborates the messages that objects can convey, from the work of delivering these messages to the public. The work of delivery – that is, of designing and producing exhibitions or programmes – should be left to people experienced in educational communications and evaluation (Screven 1993: 10).

This may seem either very daunting, or very unrealistic in relation to one's own personal situation. Nevertheless, I think Screven is right and also I think it is beginning to happen. Education staff are being drawn more into exhibition design and production, and I would use Norfolk and Leicestershire as two recent examples. At the same time, the knowledge that educators have is being increasingly recognized – even the Museums Association shows signs of this! And many young curators are very committed to the educational work of museums, either finding ways to increase their skills to become experienced educational communicators, or finding ways to acknowledge the expertise and support the methods of their educational colleagues.

I think, therefore, that education staff have a role that is growing in importance, and we need to grow in skills and confidence to meet it.

So, as educators faced with relating what we know to the production of exhibitions, what can we do? We know well how we design a range of learning experiences. If we see exhibitions as just one more of these learning experiences, what happens?

PLANNING FOR REAL PEOPLE

What do we do if we design a learning experience? (I am using the expression 'learning experience' as a generic one, as I think the basic approach is much the same whether we are teaching adults or children, and whether we are designing a workshop, a lecture or a classroom activity.)

First, we carry out research. If we want to teach something we make sure we know as much as needed about the subject-matter. Then we think about our audience, who they are and how they will respond to it. Sometimes it happens the other way round. We know who we are working with and we think they would enjoy and learn from a particular idea, experience or approach. There is a great deal of interaction, at the planning and research stage, between content and audience. The nature of the audience influences the choice of theme, the amount of material, the bias of the ideas, and of course the nature of the delivery, which in itself influences the subject-matter. The relationship between the content and the audience is dialogic. The reason why this is so important is that, as educators, we must plan for success, so we need to know what our audiences can achieve. We are able to plan effectively because of the realness of the audience. As educators, we plan for real people, or for an audience that has the characteristics of real people we have worked with previously.

If I were planning for an art lesson in school with 2P6, for example, I would think very carefully indeed about what I was going to do. In the second year of the comprehensive at which I taught for some years, 2P6 were the bottom stream of twelve streams. They were angry children, often inarticulate, who found concentration difficult, were sometimes physically violent, and were distrustful of all adults at first. If I were planning a specific activity, I would think very carefully about whether I could actually envisage Jimmy Coomber doing it, and if not what I *could* envisage. Many stunning ideas about what to do were rejected this way. Jimmy had to have something he could succeed at, within a fairly short period of time, which meant an activity that was easy to understand, and not too challenging, but would result

in something to be admired and to feel proud of (Jimmy Coomber, chisel maniac and butcher's assistant).

Planning for 2H1 was very different. These were the top stream: very sophisticated children, experienced world travellers with large vocabularies and efficient thinking processes. These youngsters needed more complex activities, or at least they needed to think about them in a more detailed way. Could I imagine Melissa Wedgewood doing whatever I was planning? What would she do when she had finished?

Later, I taught sculpture to adult beginners. Many were complete beginners, but some had a great deal of experience as painters but were beginners in sculpture. Some were elderly, with arthritic hands and impaired vision. If I were planning a session, I had in mind how Mary, Colin and Ruth would respond to the particular stimulus I was considering.

In this way, planning a learning experience involves a predicted reaction and response from a known individual. After a while in teaching, these reactions and responses become more predictable, and the planning becomes faster, with perhaps less visualization. None the less, classroom teachers, who communicate face-to-face, work from the basis of knowing their learners, and plan something that they know that real individuals can do, enjoy, feel challenged by and learn from.

Museum exhibitions are rather different. There are many different audiences, and we know none of them as individuals. Nevertheless, each audience is made up of individuals, all with their own specific needs, interests and approaches to the world, and we need to consider this very seriously.

Audiences can be broken down into groups with definable characteristics – families, young children, teenagers; or beginning or experienced learners; or people who learn through looking, reading, or doing. The technique of visualization holds good here: can we imagine our parents, grandparents, children, or friends in this exhibition? But we need to go further than this. A first step is defining the audience. Target groups, once defined, can be approached and small groups or individuals can be walked through test exhibits, or comment on models, drawings or plans. Trends in response will quickly become apparent.

Screven suggests that the reason some curators and designers produce exhibitions that do not maximize their learning potential is because they have an idealized view of the public, formed through their own social circles – in other words, they think everyone is pretty much like themselves. In general, educators come into contact with and work with a very much broader social spread, and have, therefore, a much more cosmopolitan view of 'the public'. This is a great strength, and a great beginning. It needs to be built upon. We need to find ways of acting dialogically with the exhibition audience, in the same way as we would with our classroom audience. Just as we mentally scanned our class of individuals for reactions to our lesson plans, we need to be able mentally to scan our audience groups for reactions to our exhibition plans. The mental scanning can be done only on the basis of real knowledge and real experience of the groups concerned.

So, we should feel confident that our knowledge of people is a necessary component in exhibition planning. A wonderfully pompous expression I once heard a senior academic use might be helpful: 'My experience tells me . . .'

We should also feel confident to relate what we have learned about lesson planning to exhibition planning. Visualization was one thing we were taught, but other matters

concerned defining and developing clear objectives, timing, variation in the mode and rate of delivery, assessment and modification. All of these have application in relation to exhibitions.

WHAT DO WE KNOW ABOUT HOW PEOPLE LEARN?

I have recently read a book that I have found helpful both in thinking about my own teaching and in considering how exhibitions might be made more effective. The book is called *When Teaching Becomes Learning*, by Eric Sotto (Cassell 1994). Sotto reminds us that learning theory proposes that when we listen to people talking, or read a book, or watch a TV programme, if we have a working model, a schema, in our heads that relates to what is being discussed, we can follow what is being said and relate to it. If we want to learn something completely new, however, where we have no working model, talking and reading are not enough. To learn something new, experience and action are necessary to build the model (Sotto 1994: 32–3). It is, in large part, through activity that models of the world become established in our heads (Sotto 1994: 24).

If we need schemata, or mental models, to understand abstract concepts outside the museum, it is the same inside the museum. In order to relate to the content of a given exhibition, we need a pre-existing schema. In planning an exhibition, therefore, it is important to discover what models the intended audiences have in relation to the exhibition content. In the presentation of the exhibition, these models can then be assumed and be built upon. If the models are not established, or need expanding, then ways need to be found to do this.

For example, if science exhibits depend on the concept of gravity, we need to be sure that visitors know what gravity is. If they don't, an introductory exhibit exploring the concept must be provided. In New Zealand, I found copious references in exhibits to 'pas'. Being at that stage totally ignorant of what a 'pa' was, I couldn't make sense of the exhibition. If New Zealand museums want foreign tourists to understand their displays, they need to explain that a 'pa' is a fortified and stockaded historic Maori village.

People construct meaning and sense about the world through the patterns they create. Individual fragments of information or reality mean little. It is common to find disconnected fragments of the world in museums. Meaning emerges through links and connections. The same object is something different in different contexts. A brick, for example, can be used to smash a window, build a wall, warm a bed, prevent a car from rolling. In each case it is a brick, but in each case it is also something else. The difference lies in the context, in how it is used. Meaning is drawn from the pattern of activities and material things within which the object is placed (Sotto 1994: 42–3). In museums, individual objects mean little, however beautiful. We need to find ways to enable people to perceive the objects in relation to a pattern, to make connections between the objects and their lives, their experiences and their existing knowledges.

Pattern recognition is one of the great joys of living. Finding sense in previously unrelated fragments is immensely satisfying. Learning theory tells us that most people learn through trying to work things out, where they perceive a problem (Sotto 1994: 52). Something intrigues us and we try to find an answer. It is very difficult to learn where there are no questions. In exhibitions therefore, we perhaps need to find ways to pose questions, to make things intriguing, to expose discontinuities, rather than to present a seamless and perfect narrative.

When given a set of instructions, perhaps for a new household appliance, for example, it is the rare learner who reads to the end. Most people read the first few lines and then try to learn the way the thing works by handling it.

Sotto describes the learning process, which begins when we discover there is something we need to know. It continues with an immersion in the problem, probably with initial puzzlement, and requires an active engagement, with the opportunity to obtain information and test hunches. Repeated exposure to the learning situation, with an expert who – acting as a model of competence – answers questions, together with the innate capacity of the mind to understand, leads to periodic insights (Sotto 1994: 54).

There are various levels of knowing. The strongest comes when we have had an appropriate experience. This kind of knowing is coded within us in a felt, compacted, living, tacit form and is part of our total mental structure (Sotto 1994: 99). With some effort we can make this kind of knowledge conscious and think about it verbally. This can help us to do such things as rehearse it, modify it, extend it, plan ahead, or communicate it. This is achieved through language, but the ability to work in this way, to link events, to consider experience, to plan and so on, depends on the extent of our experiential knowledge.

Sotto suggests, therefore, that there are two major forms of knowing – verbal and felt knowledge. The felt-meanings are essential to the overall growth of knowledge and understanding. Verbal experience only – words, reading and listening – is not enough to engender true learning. The feeling processes must also be engaged. The only way to do this is through action.

Feeling processes are mostly unconscious. Thinking processes are mostly conscious. Sometimes we can make our feeling processes conscious but not always (Sotto 1994: 85–7). Much of our experience is therefore encoded in a non-verbal form and is difficult to access consciously (Sotto 1994: 94). But this is where we truly feel we know things. This is the case even when we are wrong in our knowing. We may sometimes have to unlearn in order to learn. Our basic feeling processes enable us to apprehend things directly, enable us to respond to many things at the same time, enable us to take a global view, do not require the meaning of language, and work in an abstract way.

Our most powerful learning, therefore, takes place when we have had an appropriate experience and are able to reflect on what has happened (Sotto 1994: 98).

A recent book on effective science teaching (Woolnough 1994) endorses this. The author says very clearly that research into successful science learning shows that there are two factors involved: first, good teaching in the classroom, and second, effective use of extra-curricular activities. Extra-curricular activities are defined as student research projects and stimulus activities. Through stimulus activities, which of course include science centres, to which the writer gives a very warm endorsement, students gain knowledge, understanding and appreciation of the sciences, confidence in and competence at doing science, and enjoyment, enthusiasm, and commitment to the science appropriate for their own lives (Woolnough 1994: 44).

The important thing about the extra-curricular work, including the stimulus activities, is that they enable students to be active, to devise their own problems, to hypothesize, and to try things out. Science centres, with their mix of contemporary, striking exhibits, informal explainers, and the opportunity for enjoyment, enable tacit learning and affective gain, often, to quote the author, 'making a deep impression that will prove a permanent foundation for future learning and career aspirations' (Woolnough 1994: 90).

It is wonderful to see such an endorsement for the role of museums in science learning. I haven't yet found a comparable one for the use of museums in other parts of the curriculum. However, if Sotto is right about the need for felt-learning, or tacit-learning as the foundation for true knowing, and I don't doubt he is, then museums and galleries have as much to offer other areas of learning as they already offer to science. The real experiences that we offer, of objects, of buildings, of sites and of people, are essential to learning.

In conclusion, as educators we need to take Sotto's message to heart. We ourselves need to learn to verbalize from our own feeling-processes, our practical experiences of how individuals we know personally have learned. We need to excavate the unconscious knowledge of people that has grown through actual contact with real individuals and use it to help shape useful galleries and museums; and we need to demonstrate to our colleagues how vital real experience is in the construction of mental models and in acting as the foundation for true knowing. I can't think of a better justification for the existence of museums.

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