Real vs Virtual Visits: Issues for Science Centres

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More and more science centres around the world are issuing an invitation for people of all ages to enter the fascinating world of science and technology through their computer. Science centres are discovering that the Internet – in particular, the World Wide Web – provides a rapidly escalating opportunity to reach a wider audience, thereby promoting a greater public understanding and appreciation of science and technology and their impact on our everyday lives. The capacity of web browsing software to integrate text, images and sounds has attracted many science centres to the idea of establishing a presence on the web. Some science centres are setting out to explore the potential of web-based technologies to deliver experiences, which emphasise interactivity. Indeed, significant developments in web browsing software now make it possible for web users to experience far greater levels of interactivity than the passive, page-turning experiences that dominated the web in the past decade.

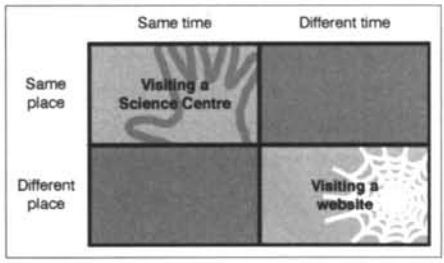
Having downloaded a web browser such as Netscape Communicator or Microsoft Internet Explorer, together with a variety of 'plug-ins' which add capabilities to the web browser, the 'visitor' can connect to the world wide web and participate in a wide range of online experiences. Today's web technologies enable the online visitor to interact with sophisticated animated sequences and simulations; navigate in three dimensional environments; control robotic devices on the other side of the planet; view a 360-degree panoramic snapshot of the surface of Mars; and monitor changes in the environment through a 'webcam' which continually captures and updates still or video images.

Several science centres are delivering interactive experiences direct to the school or home via the web. 'Although some of the science centre Web sites lack any useful information beyond museum hours, location and so on, many of them offer enriching experiences, almost like making a real, rather than a virtual, visit.' (May, 1995).

It is this issue of 'real' versus 'virtual' which is causing many science centres to carefully consider the place of online activities and events. The traditional approach of science centres has been to develop visitor experiences based on 'actually being there during opening hours'. In a grid with the dimensions of 'place' and 'time', visitor experiences in science centres would usually be categorised in the 'same place - same time' quadrant at top left (see diagram).

Whenever a visitor interacts with an exhibit, talks to an explainer, listens to a public lecture, watches a science demonstration show or participates in a hands-on activity session, the experience can only take place when the visitor is actually there at the time the experience is scheduled i.e. same place – same time.

Whenever a 'visitor' connects to a science centre web site and interacts with an online activity, reads information, listens to a sound recording, watches a video clip or enters a response as part of an online competition, the experience can take place when the visitor is remote from the science centre and is not restricted by the centre's opening hours or program schedules. These online, virtual experiences would usually be categorised in the 'different place - different time' quadrant at bottom right.



Place-time quadrant

Many areas of everyday activity can also be analysed in terms of the place-time quadrant. For example, the way people have carried out their banking transactions has been to actually visit the bank during opening hours (same place - same time). Banks are now encouraging more and more people to do their banking without actually visiting the bank and at any time of the day or night (different place - different time) through telephone or internet banking services. Whether we like it or not, banks are committed to changing the way we do our banking. By providing experiences for online 'visitors' as well as actual visitors, it can be argued that science centres may reach and influence many more people. This by itself, however, does not provide sufficient reason for establishing an online presence. The purpose of science centres is more than getting a greater number of visitors through their actual or 'virtual' doors.

Providing visitors with first-hand experiences

When the physicist Frank Oppenheimer founded the Exploratorium in San Francisco, he felt concerned that people were becoming information rich and experience poor. He wrote:

"On the whole, people have very little opportunity to have any direct experience with the separate elements of nature or technology. They watch ocean waves, but have never been shown how to observe the way waves pass through each other, bend around corners or bounce off cliffs. In a science museum, one can provide these direct experiences with the behaviour of light, sound and motion. One can set up these experiences in such a way that they not only generate, but partially satisfy curiosity. Science is not just a process of

discovering and recording natural phenomena; it is a process which develops our ways of thinking about nature and which enables us to find the connections that simplify and at times enrich our comprehension and awareness of nature." (Oppenheimer, 1968)

Feher (1990), in an article about the role of interactive science centres in studying how people learn, refers to a problem which is endemic in our schools: teachers teach abstractions, definitions and explanations of phenomena that, for the most part, students have never explored, or, worse still, that students may not even know actually occur. If schools so often put the cart (explanations) before the horse (first-hand experience of natural phenomena), modern science museums reverse the process'. Science centres '. . . present natural phenomena in the form of exhibits that are interactive and manipulable, exhibits whose express purpose is to enable visitors to explore and experiment'. The need of virtual visitors is no different-online activities should enable virtual visitors to explore and interact with phenomena in order to develop first-hand experiences.

Catering for visitor diversity

Actual visitors to science centres bring with them great diversity in terms of their previous knowledge and experience, their assumptions and their expectations, as well as their ways of thinking and learning. Science centres expect this diversity and design their exhibits and programmes accordingly – as open-ended opportunities, which provide flexibility in the manner and level of investigations individuals and groups may wish to undertake. Online exhibits and programs for virtual visitors should also be designed with this principle in mind.

Developing understanding

When actual visitors interact with hands-on exhibits and activities in science centres, they encounter science phenomena in engaging ways, manipulating devices and data to test and develop their understanding – the more compelling the experiences, the more likely learners will develop their understanding of the phenomena.

Virtual visitors, too, are more likely to develop their understanding if online activities are designed to enable people to test their ideas.

What are science centres doing on the web?

A useful place to begin a search for science centres and the various programs they are establishing on the web is a directory of science centres worldwide, located at **www.astc.org**. The Science Learning Network was originally

established by six science centres in the USA, each working with a school in their district to develop web-based learning resources and networking facilities for science centre staff, teachers and students. This web site is located at **www.sln.org** and involved the participation of other science centres in other regions of the world.

Like many science centre web sites, the Questacon site provides information about Centre programs and a preview (virtual tour) of Centre galleries. The popularity of this web site is due to Questacon's interest in encouraging online interactivity – after all, Questacon is a centre which encourages as much interaction as possible! Questacon's web site – which features zones for kids, for grown-ups and for teachers – is located at **www.questacon.edu.au**

References

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