Educational transactions in museum on-line learning initiatives

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Museum on-line learning initiatives (MOLLIs) have been developed in a partnership between the University of Exeter and the Royal Albert Museum, Exeter, UK. Educational transactions in MOLLIs are analysed as a series of dynamic processes: information exchange, skills application, knowledge construction, social interaction and self-expression including beliefs and creativity. Each of the processes can be described as a discrete educational entity, but every individual's experience of a MOLLI arises from a unique and complex combination of them all. Thus, in addition to a reductive framework for analysing educational transactions, there is also a need for a synthetic, integrative framework through which relationships between educational transactions, people and resources may be more comprehensively modelled. The authors suggest that integration may be achieved through a socio-cultural approach, extended to take account of relevant parts of ecological and complexity theories.

Introduction

Museums are concerned with interactions between people and resources in representations of the past. Resources are taken to be museum collections and the technological means of accessing them. Technological means range from static exhibitions to dynamic multimedia. Traditionally, museum professionals worked with collections and the technology of access in engaging audiences in constructing meaning. Meaning in this sense is taken to be knowledge and beliefs about the past. The process of constructing meaning involves transactions between mediators and audience through interactions with resources. Until recently, these relationships were largely place-bound, with most of the transaction happening in the museum, although there is a trend, part a wider redefinition of museums, away from authoritative fact towards 'narrative' based on negotiated meaning between audience and museum (Roberts, 1997).

With the advent of Internet technology the relationships and the transactions have changed. The technology of access now delocalises the place of transaction and changes the relationship between the mediators, the resources and the audience. It is now possible to undertake a 'virtual' visit to a museum by visiting its website. The website is an entity designed around content and forms of interaction. When an individual visits the website he or she *de facto* becomes part of the associated Internet 'community' of mediators and audience (collectively 'participants'). The relationship between the community and the site is dynamic: both change internally and relative to each other. The community has a fluid membership which, through its interactions

with the website, modifies the content of the latter. Transactions are not simply

delocalised, they are also part of: (i) an interplay between information, knowledge,

skills, beliefs, forms of expression and social interaction, which collectively may be

termed 'educational transactions'; and (ii) a complex and dynamic arena that

constitutes the website, the community and the interactions between them (Chesebro

& Bertelsen, 1998; Hakken, 1999).

Research has been undertaken with museum open, on-line learning initiatives

(MOLLIs). MOLLIs are cultural heritage projects undertaken by the Telematics

Centre at the University of Exeter in conjunction with local museums and freely

available at: www.molli.org.uk

The following questions are being investigated:

- What are the relationships between participants, networks and resources in virtual
  visits to museums?

- How do these relationships affect educational transactions?

- What are the collective characteristics that emerge from these relationships and
  transactions and how might they be modelled in an integrated, explanatory
  framework?

This paper is concerned with an analysis of educational transactions. In the light of

analysis, some theoretical and methodological bases to establishing an integrated,

explanatory framework are proposed.

Investigating MOLLIs

In viewing MOLLIs as educational communities, a series of dynamic processes have been specified to provide a means of analysing the transactions involved. The processes are:

- *Information* exchange – giving and receiving information, where information is taken to be facts and constructs which have the potential to be integrated into a context (Hakken, 1999).

- *Skills* application – the ability to perform certain actions, which may be innate or learnt, by utilising knowledge or techniques (Wenger, 2000).

- *Knowledge* construction – integrating new information (facts and constructs) or techniques with previously learned material (Osborne & Wittrock, 1985).

- *Social* interaction – reciprocal or collective action resulting in exchanging or challenging information, ideas, experiences, etc (Harré, 1979).

- *Self* expression including expression of *beliefs* and *creative* expression – especially the underlying convictions or constructs that determine what is valued and how it is portrayed (Oskamp, 1977); proactive forms of concrete or abstract representation (Sternberg, 1988).

The processes conform to a constructivist view of education that takes account of affective and conative as well as cognitive dimensions in educational transactions. The central premise of the constructivist framework is that an individual constructs meaning as he or she interacts with the environment and tries to make sense of it. These experiences are unique although there may be some generalisable things that can be said about them. In particular, individuals tend to generate perceptions and meanings that are consistent with their prior experience and these are likely to be

different from those held by others in the learning community, (Dillon *et al,* 1999; Falk & Dierking, 2000; Osborne & Wittrock, 1985).

Data on transactions were derived from:

- Analysis of selective aspects of website interaction.

- Participant and non-participant observation through involvement in and analysis of responses to questions.

- Questionnaires about curricula applications and ways in which MOLLIs promote learning.

Transactions in MOLLIs associated with two exhibitions, *Totem Pole,* and *Braid and Beads,* were analysed.

Totem Pole

The *Totem Pole* exhibition was held at the Royal Albert Memorial Museum in 1998. It was concerned with the life and culture of the Nuu-chah-nulth First Nation of Vancouver Island, Canada. It involved a three-week residence by members of the Nuu-chah-nulth who carved a totem pole for the City of Exeter under the direction of master carver Tim Paul. The totem pole became the unifying element of the exhibition, which included artefacts from the Museum's collections and a series of workshops.

The associated MOLLI provided a unique opportunity for school children from Devon and beyond to prepare for, undertake and follow up a visit to the museum. They were able to follow the day-to-day progress of the pole all the way from

Vancouver Island to Exeter and then, through a journal, the residency. The journal included photographs of work in progress on the pole, the carvers and their tools, audio and video of ceremonies to dedicate the pole, and an audio interview with the carver.

Discussion was facilitated through an 'ask and tell' activity which allowed children to engage with the Nuu-chah-nulth group in Exeter. The facility took the form of a web-based threaded discussion form powered by Ceilidh, a commercially-produced forum by Lilikoi Software (figure 1). Registration was restricted to a pilot group of eight schools, of whom three eventually participated in the discussion with curators at Exeter museum, two teacher educators from the University of Exeter, members of the Nuu-chah-nulth group in Exeter and a Nuu-chah-nulth school in Vancouver Island. The discussion was moderated by the co-author Dominic Prosser.

Figure 1. Totem Pole: 'ask and tell' activity

Braid and Beads

The *Braid and Beads* exhibition in 2000 focused on the work of local artist Jacqui Carey and items of adornment from the Royal Albert Memorial Museum's collection. Jacqui created four contemporary works inspired by items in the collection. There was a series of workshops in the museum and local schools, led by Jacqui and local mixed-media artist Edwina Jaques, which explored braid and bead techniques.

The associated MOLLI had an 'adopt an object' activity and a series of pilot webcasts that allowed children from six schools, from local, rural and far-distant locations, to interview Edwina Jaques live on-line. The MOLLI included a series of curriculum-linked mathematics activities based on artefacts for 8-11 year olds.

In the 'adopt an object' activity, participants were invited to share their feelings about objects openly with others in the website. They were encouraged to make and share their own meanings about the object and interpretations of it. The activity was headed with the statement "We value what these objects mean to you", to illustrate that whereas in other contexts allowing something to be adopted against payment (e.g. an animal in a zoo), the value that MOLLI placed on this adoption transaction was the participants' *responses*. Participants were able to choose and comment on one of 20 braid and bead objects from the Exeter collection, each with its own page with a simple description and image, links to the adopt form, and background information on the originating culture. The 'adopt' form was designed to promote sensory and emotional engagement with the object (figure 2). Prompts were based on

neurolinguistic principles of representational systems (Bandler & Grinder, 1985) and

research on the motivations people have for going to museums, they were:

- I chose this object because [...]

- This item makes me feel [...]

- Associate the smell of [...] with this object.

- I associate the sound of [...] with this object.

- If I could touch this object, I think it would feel [...]

- This item makes me think about [...]

The form once submitted was automatically added to the website and could be viewed

within seconds by the author and any other website viewer.

Figure 2. Braids and Beads: 'adopt an object' activity

Educational transactions

The outcomes of the MOLLIs, in terms of educational transactions were:

Information exchange

Information may be regarded as raw material for subsequent educational transactions. Thus, by utilising text, audio, and images from the *Totem Pole* site about the pole, the process of carving it and the culture from which it originated, participants were able to frame their information exchanges through posing appropriate and relevant questions in the 'ask and tell' discussion forum. Information exchange also helped participants prepare for face-to-face transactions with Nuu-chah-nulth in the workshops that took place in the museum. In 'adopt an object' in *Braid and Beads*, participants collected textual and visual information about objects that subsequently allowed them to form their preferences; it provided a context for the expression of their feelings about the objects, which constituted their part of the exchange.

Skills application

The ability to perform certain actions may be viewed in terms of the application of general learning skills as well as subject specific ones. The application of literacy skills for example, includes reading for different purposes, skimming to gain an overall impression, scanning to locate information, detailed reading to obtain specific information, posing pertinent questions about a topic under investigation, and distinguishing between fact and opinion. The application of information and communication technology skills involves finding information in computer-based sources, using organisational devices to help decide which parts of material to read closely, web navigation, and participation in on-line discussion. These and other examples of skills application were evident in both MOLLIs.

Knowledge construction

This is the most difficult educational transaction to analyse because it typically takes place as a mental activity and may not be evidenced in concrete forms. Through *Totem Pole* participants were able to engage in what Eggleston (1995) calls "powerful grassroots experiences". These include the relationships that were developed between the participants and the First Nation people. The quality of these relationships, together with the supporting website resources, not only reinforced the understanding of the meaning and values inherent in Nuu-chah-nulth culture, but formed a context within which English children were able to begin to understand their own personal values, meanings and beliefs and those of the communities within which they live. *Braid and Beads* incorporated deliberate strategies for evoking prior knowledge, prior experience and reminiscence.

Social interaction

The opportunities for social interaction developed through MOLLIs were extensive and deliberate. The resources stimulated a number of actions that align with Hakken's (1999) analysis of levels of relationship formed in 'cyberspace': self (self-identity), micro-relationships (friends, acquaintances), meso-relationships (civic and regional communities), macro-relationships (national and transnational communities).

At the level of self, participants undertaking the 'adopt an object' activity explored their own beliefs through their reactions to objects, thus offering an insight into self-identity. Participants could share these beliefs by printing and discussing them with friends at a micro-relationship level or with a larger social group via the website at a

meso and macro levels. The emergence of self-identity mediates and modifies the individual's role and attitude towards others at micro, meso and macro levels.

At the level of micro-relationships many of the submissions to the Totem Pole 'ask and tell' activity had clearly been generated by pairs or groups. This was true of both enquirers and respondents. In the case of enquirers it is evident that teachers had formed children into groups to develop and submit their questions for pedagogical and logistical reasons.

At the level of meso-relationships, through discussion about 'adopt an object', participants developed relationships beyond immediate, known, groups. The project managers initially determined these interactions but these in turn spawned new and separate micro- and meso- relationships, for example, direct contact with an artist as a result of participation in a webcast activity.

At the macro level, transnational relationships were formed with people from other cultures.

Self expression

In *Totem Pole,* discussion encouraged all participants to express their feelings and reactions to the pole and the originating culture. UK participants revealed their beliefs, often as implicit assumptions about the Nuu-chah-nulth. The Nuu-chah-nulth revealed their own beliefs about their culture. For example:

- Q: "What does your national flag look like?" A: "We don't have a national flag or symbol. What we do have is songs which describe the borders of our Nation.

When we sing these songs, everyone knows (especially our neighbours) which territory is ours!"

Creative expression was evident through curriculum enrichment arising from discussion, particularly in creative writing and design and technology. One participating school created their own three metre wooden totem pole in response to participation in *Totem Pole*.

In addition to the traditionally accepted motivators such as information gathering and intellectual curiosity, Silverman (1993) has identified factors such as social interaction and reminiscence as key elements. The museum space offers opportunities to build relationships and share meaningful experiences with others: these are as important as the objects and exhibits. The exhibits can be the stimulus to memories, prompting retelling of significant moments and encounters. This is closely allied to other experiential factors such as involvement through making a personal connection and exploring one's own self-identity (McDermott-Lewis, 1990; Silverman, 1991). In some cases fantasies and time machine experiences (temporal displacement) may be evoked (Walsh, 1991). Responses in MOLLIs included:

- Reminiscence: e.g. Gay, British female, commenting on-line on a cradle board (North America, Iroquois): "This object makes me think about my own children when they were small."

- Fantasy: e.g. Amy, aged 6-8, commenting on a Gorget (Tahiti, Society Islands, Polynesia): "This object makes me feel like I am a princess."

- Personal connection e.g. Edwina, 26-35 year old Australian female, commenting on the 'Glengarry Bonnet' (North America, Iroquois): "This object makes me feel inspired to create craftworks of my own."

- Temporal displacement: e.g. Katharine, British female, commenting on-line on a Suit of Samurai Armour (Japan): "This object makes me think about a distant time and place."

Explicit expressions of belief included:

- Joseph a British male aged 17-25, commenting on a 'chief mourner's costume' originally from the Solomon Islands via 'adopt and object', revealed the following belief about death and funerary rites: "This object makes me think about mortality, the celebration of a person's life is always and everywhere [a] vital thing."

Examples of creative expression included:

- A special needs group of 8 year olds, working with the 'adopt an object' questionnaire on paper, were encouraged by their teacher to extend this activity by using sound and smell associations as the basis for poems about their chosen objects.

Emergent elements

Educational transactions in MOLLIs have been analysed as a series of discrete processes starting with the fundamental units on information exchange and skills application and leading to knowledge construction, social interaction and self-expression. In returning to the business of museums, these processes collectively

amount to the construction of meaning. Meaning is constructed in the gap between the object and the individual – it is mediated by the information provided to participants, their own prior knowledge, beliefs and experience (including of knowledge management) and critically by opportunities for expression. The question now is what emerges from MOLLIs over and above the sum of these educational transactions?

Like the World Wide Web itself, the MOLLI on-line community can be conceived as a network of networks, a number of discrete communities, each with their own networks and hierarchies. For example, in the *Totem Pole* discussion forum, participants were drawn from the Exeter Museum community, the originating Nuu-chah-nulth community, school communities, individual families, and the Telematics Centre community. This is illustrated in figure 3.
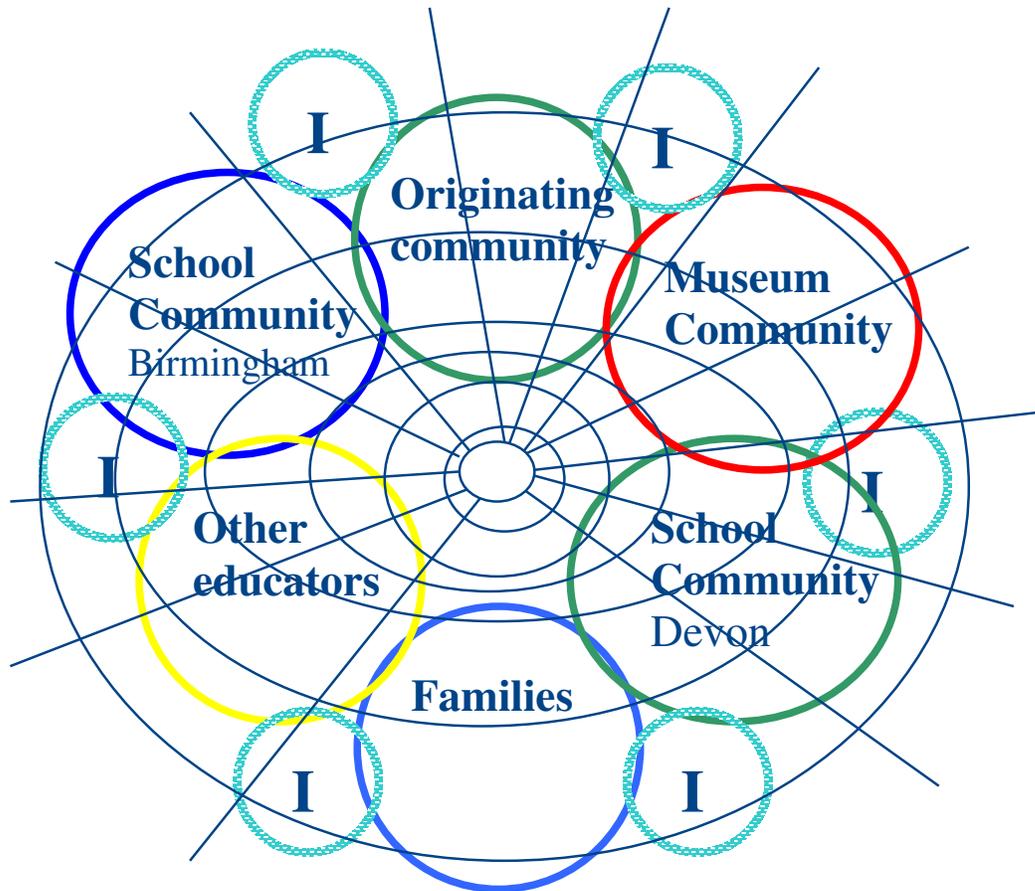
Figure 3. The MOLLI Totem Pole community. The 'I' signifies individuals

In the non-virtual setting, each community was bound by its own forms of governance, explicit and implicit, which therefore influenced the way in which individuals engaged with the discussion in the virtual setting. In the case of an individual child, his or her participation might be constrained by limits on access imposed by the school, teacher or parent. The maturity of these discrete non-virtual communities also ensured that whilst there was interaction between members, it was not possible almost by definition for individuals to slide between communities and become part of another community.

It can, however, be argued that through the MOLLI community two new generic communities emerged: those of learners and teachers. It is in these two groups that every individual could participate with free movement between the two. In this sense the two emergent communities were unbounded with, for example, members of the originating community answering pupil's questions and in so doing adopting the role of 'teachers'. But in an unbounded community, roles (in this case of teachers and learners) are interchangeable. Thus as one of the Nuu-chah-nulth reflected:

> "Today as we look back on our time here in Exeter we see what we have been doing here since we arrived and the one main thing that keeps coming forward is that we are telling the people that we are meeting how we live today. We are clearing up misconceptions of how our ancestors, as well as us today, have lived. Some of the frequent misconceptions we are clearing up is that we are people that are Canadian First Nations and not American. It is the greatest misconception we have come up against and one which our children are excellent at getting straightened out."

The originating community learned about how their culture is perceived by English people, and in the process of doing so became teachers. With their misconceptions cleared up, pupils may also have become teachers of their peers, friends and family through retelling of their newly gained knowledge.

Towards an integrative framework

Conventional approaches to studying communities treat them as socio-cultural entities in a particular place at a particular time. The emphasis is on human interaction.

Internet technology enables communities to be established that are independent of space, of variable lifetime, and with different rules for entry and participation. With Internet communities centred on museum websites, the collections, the technological means of accessing them and human interaction are all important components. As analysis of MOLLIs has shown, the relationships between the three are complex and dynamic and the authors are currently exploring new ways of modelling them. Socio-cultural approaches are most commonly used to model 'communities of practice' (Wenger, 2000). These approaches can be extended to take account of the importance of resources by drawing on ecological theory, and to accommodate complexity and dynamism by drawing on complexity theory. In bringing these three theories together, the intention is to generate a unifying framework to model the whole situation.

The application of socio-cultural, ecological and complexity approaches will depend to varying degrees on treating museum websites and their associated Internet communities as systems. 'Strong' systems have clearly defined boundaries and coherent internal dynamics governing their development, structure and stability and their responses to external influences. Websites and their communities conform more to the notion of a 'weak' system of the type used in modelling complex relationships between indigenous peoples and their environments (Taylor & García-Barrios, 1995; Taylor 1999).

Viewed as weak systems, Websites and their communities are fluid with historically contingent situations resulting from intersecting processes in which boundaries and categories are fluid, levels and scales are not clearly separable, and structures are subject to frequent restructuring. Differentiation and change characterise these

situations. Taylor calls this 'unruly complexity'. Others who have studied human-technology relationships as complex phenomena have described similar characteristics (e.g. Cillers, 1998; Lebow, 1993; Jegede *et al,* 1995; Thorpe, 1995; You, 1993).

Taylor used a systems dynamic model for his case studies. It was multifaceted and allowed many scenarios to be investigated with intersecting social and economic variables. In applying this approach to websites and communities, the authors are adopting a form of collaborative action research so that researchers explore with members of the communities key issues, questions, disputes, and actions. The aim is to identify the connections, things that motivate, facilitate or constrain inquiry or action. To this end Taylor used concept mapping. Things connected to the key issue might include theoretical themes, empirical regularities, methodological tactics, events, localities, agents, institutional facilities, disputes, debates and so on (the 'emergent properties' of a complex system). Mapping is undertaken in a workshop setting so that participant thinking is exposed to questioning by researchers and other participants. Workshops may be conducted on-line or face-to-face or both. The workshop interaction is intended to lead to participants clarifying and filtering the connections and eventually reorganising their maps so as to indicate which connections are significant. In this way the dynamics of the situation are revealed. Workshops of this type will be undertaken by the authors in the next phase of their research into MOLLIs.

In building outcomes of individual educational transactions and the collective characteristics of the whole system into an inclusive, integrative framework it will be necessary to also integrate:

- What is know generally about the nature of information and its social and economic utility (e.g. Macdonald, 1998).

- What is know about the characteristics of complex communities (e.g. Wenger, 2000) and their behaviour in asynchronous space and time (e.g. Nardi & O'Day, 1999).

Applications of the research

In addition to what it adds to the understanding of virtual educational communities, the research has important implications for the ways in which audiences perceive museums and museums will be expected to operate in the future. The authors expect to provide insights into:

- How Internet technology impacts on conventional museum going.

- The qualitative differences between museum going and virtual museum visits.

- The role of virtual visits in widening access to new users and previously underrepresented groups.

- The type of intellectual and emotional engagement with museum objects facilitated through virtual visits.

- The contribution that Internet communities and virtual visits are making to the development of new and innovative methods of interpretation.

- The relationship between Internet technology and heritage management policy.

- The impact of Internet technology on the identity of museums.

Acknowledgements

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