

# Virtual Museum Learning

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## Introduction

This paper examines children's and adults' attitudes to virtual representations of museum objects. It draws on empirical research data gained from two web-based digital learning environments conceived and designed by the authors: the Burmese Theatre Orchestra project ('Burma') which was based on the Designated World Cultures Collection of Exeter Museums, and the Virtual Victorians project (based on the Tiverton Museum of Mid Devon Life collection). Both resources were developed principally for UK primary schools.

The paper explores the characteristics of on-line learning activities that move children from a sense of wonder into meaningful engagement with objects and their original contexts both in their virtual space and their physical space. The relationship between the virtual object and the physical object is examined, seeking an answer to the question: how does engagement with a virtual collection affect the attitude to the physical collection itself?

The analysis revealed findings across a wide range of research areas. Areas which will be the subject of future publications include: family learning in museums, family learning through Information and Communication Technology (ICT), museums and literacy, emotional responses to virtual objects.

## Burmese Theatre Orchestra

The Burmese Theatre project ('Burma') is a partnership project between Exeter Museums and The Telematics Centre, University of Exeter and is based on the Designated World Cultures Collection of Exeter Museums.

The Burma website (Prosser, D., Eddisford, S., Prosser, M., Osborne, R. & Kingsland, E., 2003) at [www.molli.org.uk/burma](http://www.molli.org.uk/burma) was designed in 2002, to support the English primary curriculum (age 5-11) in Music, English, Geography, Art and Design, ICT and Design and Technology. Users are able to find out about the Burmese Theatre orchestra held in store at the Royal Albert Memorial Museum Exeter, and to listen to some of the instruments being sounded. A simulation developed in Macromedia Flash, allows users to play some of the instruments, and to record and play back their own compositions (a screen shot of this section of the site is given below at Figure 1).

A scheme of work for primary teachers was developed and made available on the site. Following the scheme the children read and analyse traditional tales upon which Burmese puppet dramas are based, develop their own 'script' from one of these tales, and produce their own puppet show, making the puppets, scenery and box theatre. The children are invited to compose their own music for the show, either using the online Burmese instruments, or their own comparable instruments. A

small gallery of Burmese Lacquer objects is provided as a source of inspiration for the decoration of the theatre, and to support a further Design and Technology activity: making a papier-mâché lacquer bowl.

Known users of the site include teachers, parents, children in and out of school, adults in general and other museum professionals.

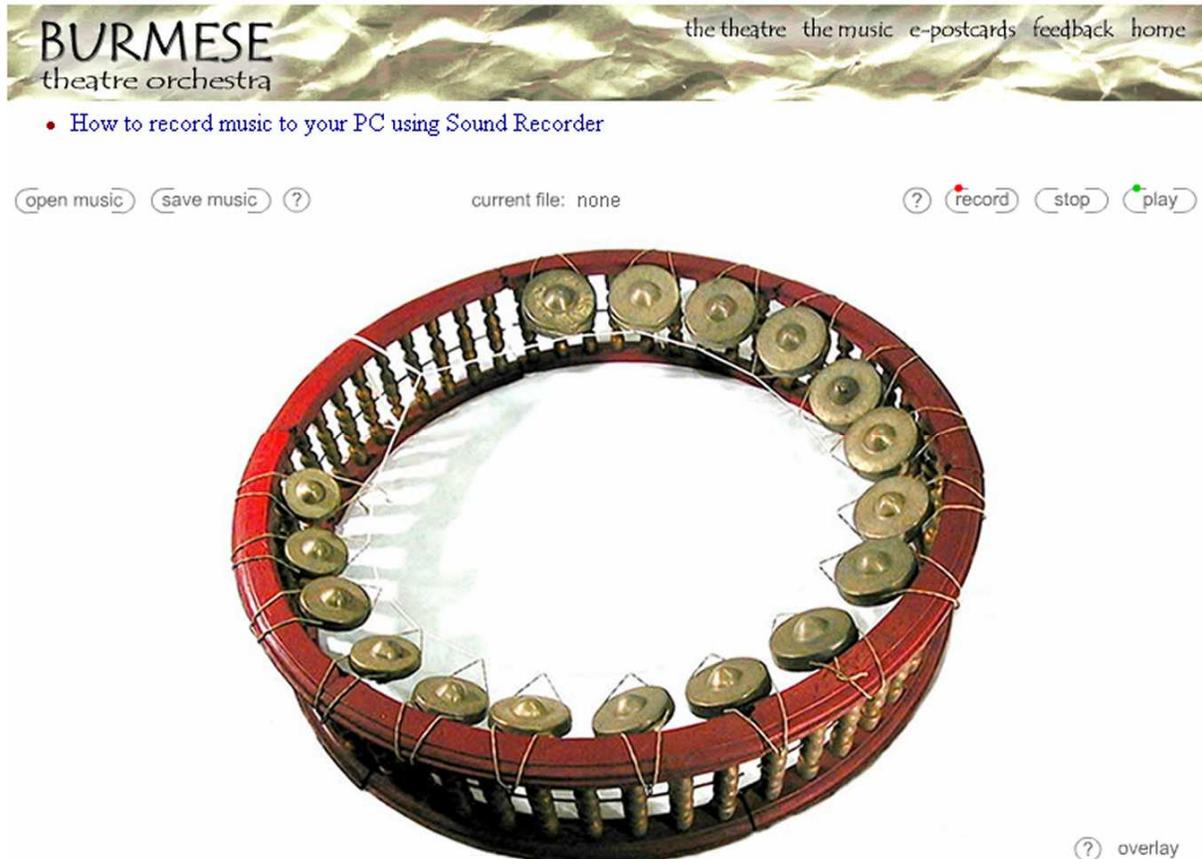


Figure 1: Burmese Theatre Orchestra web page

## Virtual Victorians

Virtual Victorians (Eddisford, S., Prosser, D., Kingsland, E., & Osborne, R., 2003) is a partnership project between Tiverton and Mid Devon Museum Trust and The Telematics Centre, University of Exeter. Developed between 2000 and 2003, Virtual Victorians extends and improves the learning resources of a small, successful museum-based education service through the WWW at [www.victorians.org.uk](http://www.victorians.org.uk). It was designed to support the English primary (age 5-11) curricula in History, ICT and English.

The site provides learning material for schools to study life in Victorian Times (a screen shot of the homepage is provided below at Figure 2). There are opportunities to access the museum collections through digital images of Tiverton Museum artefacts and access to objects not normally available for handling or display. Users can follow a typical week in the life of a Tiverton working class family, and even ask the family questions via a web form in 'Ask a Victorian'. The 'e-toys' section of the site uses Macromedia Flash (which allows multimedia designers and developers to integrate video, text, audio, and graphics into immersive, rich experiences) to allow users to manipulate some

of the objects in simulations designed to replicate the original Victorian experience and use of the objects.

Although the resource focuses upon Tiverton in Victorian Times, it has been heavily used in the UK and, to a lesser extent, also in South Korea, America, and New Zealand. Known users of the site include teachers, home-schoolers, parents, children in and out of school, adults in general and other museum professionals.



Figure 2: Virtual Victorians web page

## Research Methods

Data was collected and analysed within the interpretative paradigm following a grounded theory approach. Analysis was undertaken using qualitative and some quantitative methods.

The Burma data was collected from a single year 3 (age 7-8) class in a local infants school, which followed the scheme of work for the production of a shadow puppet play. The school spent eight weeks working on the Burma project in 2002. Data was collected by non-participant observation of the class at work. The observation informed the development of semi-structured interviews with some of the children in the class. In the first round of interviews, which took place mid way through the project, eight children were interviewed. The children were selected by convenience sampling,

although an equal gender balance was ensured. Analysis of this data led to initial formation of hypotheses that were tested by being used as the topics for the second round of interviews. In the second round of interviews, which took place at the end of the project, four of the original interviewees were interviewed again (two boys and two girls). Again the selection was based on convenience. The class teacher was also interviewed twice during this project, in the second interview her views on the preliminary findings were sought, copies of class work taken for analysis, and feedback forms from parents were collected. The findings used in this paper are based on the observation and interview data.

The Virtual Victorians data was collected from a wider range of sources between 2000 and 2003. Twenty teachers who had used the site with their classes were asked to complete feedback forms, though only two forms were received. Less formal feedback was received by email: 81 responses from teachers, eight from children, 12 from parents and two from museum professionals. This data has been analysed through coding, and theories derived as a result. These theories have been constantly compared against existing and new data. In addition content generated as a result of interaction with the site has also been analysed and coded. Relevant to this paper are the ‘Ask a Victorian’ questions submitted. These have been analysed and coded, and as there was sufficient quantity of response, some simple descriptive statistical analysis has been undertaken on the initial results. Findings from other textual data, formal evaluations by teachers or LEA advisers fall outside the scope of this paper.

In both methods, literature has been treated as another data set against which emergent theories have been tested. Figures 3 and 4 below illustrate the methods used.

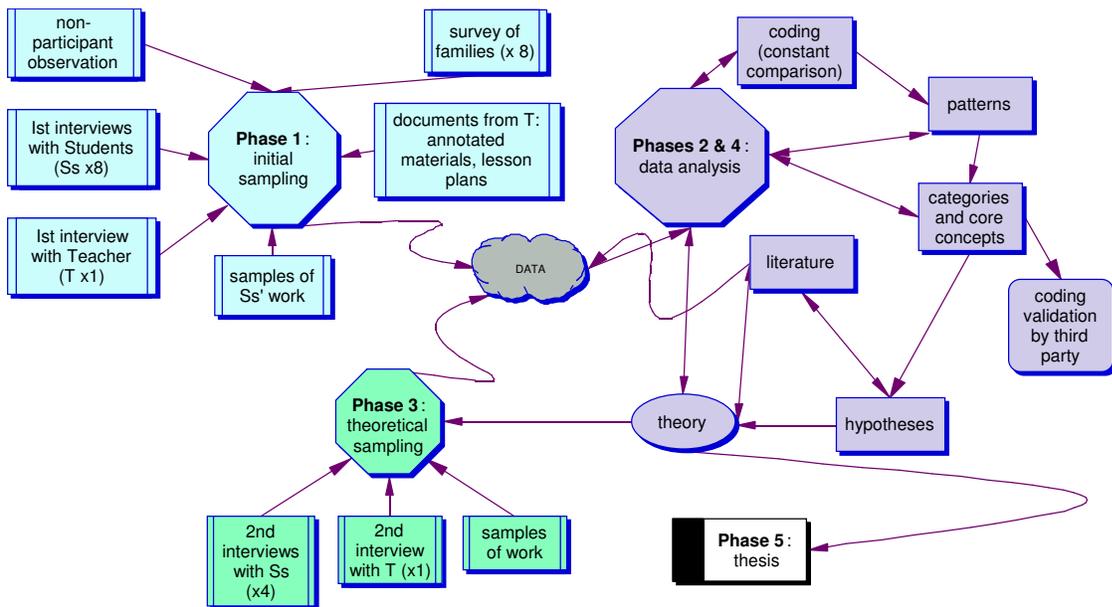


Figure 3: Burmese Theatre Orchestra research methods

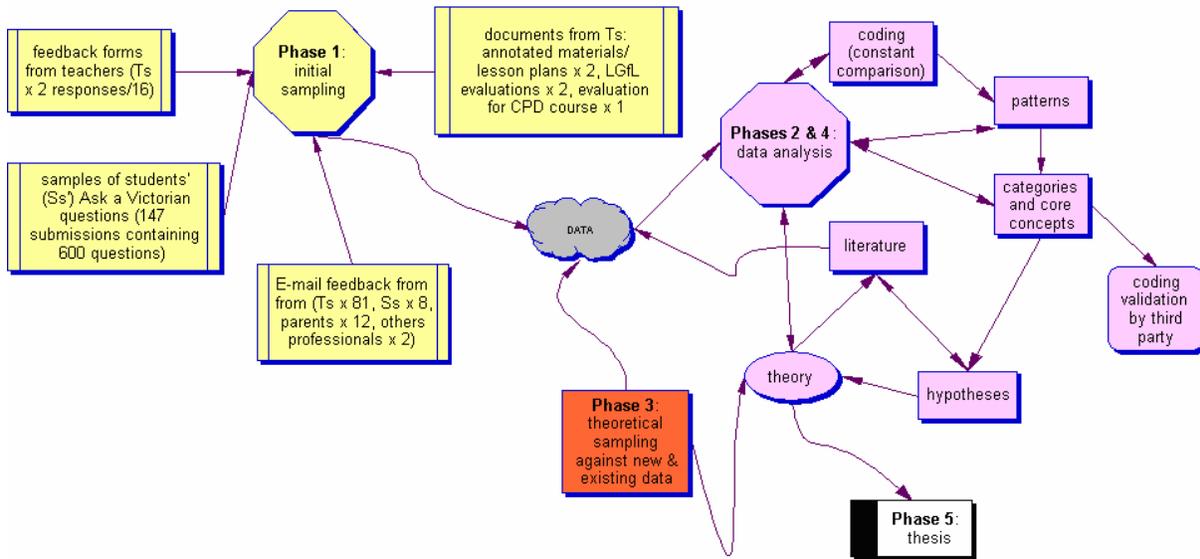


Figure 4: Virtual Victorians research methods

## Findings and Discussion

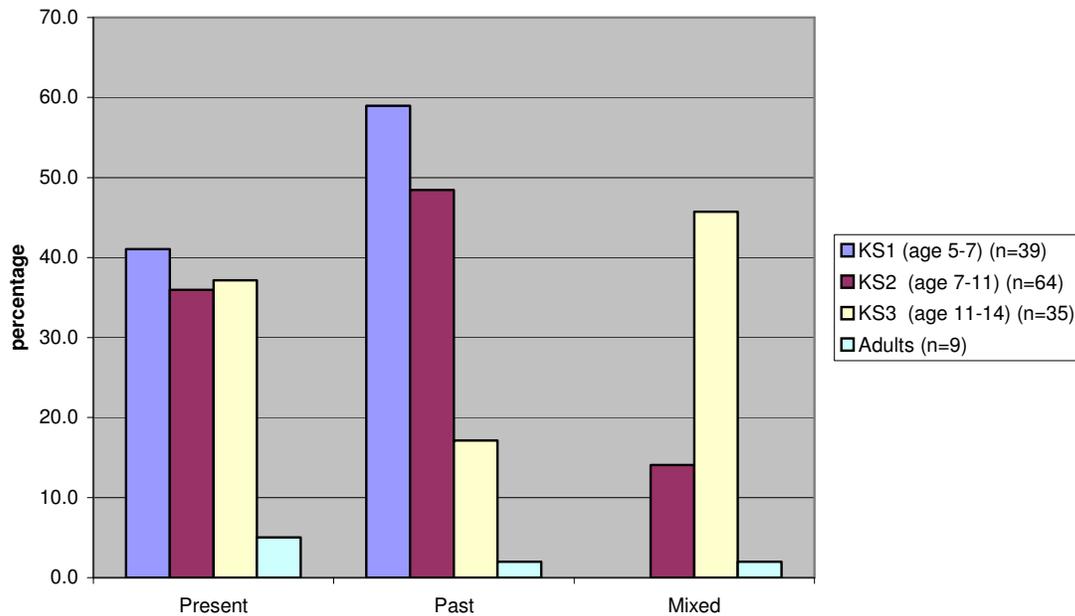
### Virtual learning environments and the willing suspension of disbelief

Samuel Taylor Coleridge argued that our response to drama is characterized by a “willing suspension of disbelief,” and thus involves the very same ingredient of belief that is essential to everyday emotion (Coleridge, 1817). The origins of the theory of willing suspension of disbelief lie in Aristotle, the father of literary criticism (Moxon, 1934), who suggested that through its unity, and its implicit universality, tragic drama could ‘through pity and fear achieve the purgation and purification of such emotions’ in the viewer (Aristotle, pre 322BC, VI, 1449b27-28). The theory of willing suspension of disbelief has been subsequently developed in theatre (Beckerman, 1990) and film studies (Metz, 1975; Fuery, 2000; Hayward, 2000) and literary criticism (Forster, 1974; Lodge, 1992), and even more recently in the field of computer gaming (Laurel, 1993; Mateas, 2002).

In certain digital interactive exchanges, children, and adults, are willing to suspend disbelief in order to engage with the virtual world. In so doing children suspend their focus on the physical world and enter into the virtual world as willing participants, dispelling expectations of the normal conventions and logic of reality, and creating a belief in the virtual or unreal. The virtual learning domain must be sufficiently credible, compelling, and indeed enjoyable, in order to create and sustain the virtual world in which they can believe. Children can imagine themselves playing a real Burmese xylophone, or that they are really asking a 12 year old Victorian girl a question. A similar phenomena in physical museum going experiences has been identified by Roberts as ‘fantasy’ (Roberts, 1997), where she describes museums having the potential to become time machines capable of transporting visitors through history and allowing them to experience other periods and cultures.

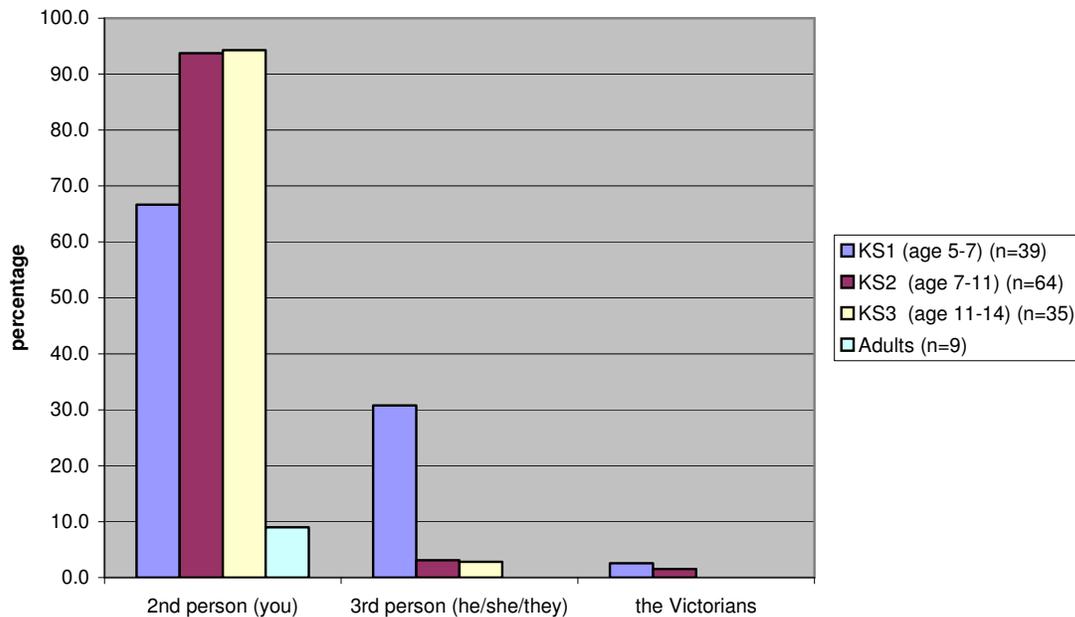
Analysis of the questions sent as part of the Ask a Victorian activity suggests that a high proportion of children have experienced some degree of willing suspension of disbelief. Many of the questions received are in the present rather than the past tense, as shown in Figure 5 below. Participants have chosen to enter into the belief that they are communicating with a Victorian rather than simply receiving an answer to their question. Alice Poslett, aged 12 in 1874, is asked questions such as

‘Do you like school?’ ‘Do you use a slate, pencil or quill?’ ‘What time do you go to bed?’ Children ask very personal questions such as ‘Were you sad when your brother died?’ or ‘Who is your favourite brother or sister?’ Such questions illustrate the extent to which some questioners have taken on the belief that Alice is a ‘real’ person and have empathised and identified with her.



**Figure 5: Tenses used in the Ask a Victorian questions. N (number of submissions) = 147<sup>i</sup>**

Children at Key Stage 2 (age 7 to 11) and 3 (age 11 to 14) are more willing and able than children at Key Stage 1 (age 5 to 7) to enter the simulated reality of ‘Ask a Victorian’ and address the recipients of their questions in the second person, as if they were ‘real’ people, rather than a source of information (see Figure 6 below). In order to suspend disbelief and create the belief which allows them to enter into the simulated reality of Ask a Victorian, children must have developed the ability to distinguish between the real and the imaginary world as well as be willing to do so. The older Key Stage 2 (age 7 to 11) and Key Stage 3 (age 11 to 14) children seem to acknowledge the pretence, and willingly participate. It is interesting to note that adults, without exception, do likewise.



**Figure 6: Forms of address used in the Ask a Victorian questions. N (number of submissions) = 147<sup>i</sup>**

Children at Key Stage 1 (age 5 to 7) are far less likely to ask questions in the present tense or in the second person singular than children in Key Stage 2 (age 7 to 11) and Key Stage 3 (age 11-14) or the adults. The boundaries between real and imaginary seem less well-defined in younger children and as a consequence they may be less able to distinguish between the two and suspend their disbelief. Adults are totally willing participants in this pretence, asking all questions in the second person as shown in Figure 6 above. It is possible that in the case of the younger Key Stage 1 (age 5 to 7) children their questioning is directed or influenced by a teacher, though this would contradict our findings about adults in general.

The willing suspension of disbelief, which allows the child to communicate across time and space, is intensified by the virtual. The virtual context is capable of providing a focussed and coherently structured experience for the user: the conditions for suspension of disbelief and creation of belief. Personalisation is an important design element (Mateas, 1997). The opportunity that the virtual world provides for the creation of belief in the Victorian Poslett family, contributes to the engagement with the objects from the collection and the development of the key historical skills of enquiry and empathy, increasing the users' historical understanding. As in much modern fiction, the Poslett's take on the narrative function of the site. Presenting content through a form of what literary critics have called interior monologue (Lodge, 1992), the consciousness of these characters sustains the realistic illusion and creates an emotional intensity. Referring to the Poslett characters as real people invites sympathetic interest (Lodge, 1992).

“Finding your site was a real bonus for him since it is more “personalised” and made the information more interesting and understandable. He can relate to the people more easily than just reading the information.”

*Parent A (from USA) emailing comments on Virtual Victorians.*

“Information about the family is gradually unfolded by visiting the various site links. This unfolding is achieved mainly by interactive means.”  
*UK Teacher B in evaluation of Virtual Victorians for ICT training course.*

The children who were studied undertaking the Burma project, understood that virtual learning environments can extend experience in a manner that is not possible in other ways. Many objects on reserve, such as the Burmese instruments or the Victorian doll, Florrie, are too delicate to display. Even if they were on display you could not interact with them in the way you can digitally. This gives the object more relevance, and creates the opportunity for a rich user experience, simulating the original purpose of and interaction with the object. Such elements, ‘e-toys’, stimulate and aid learning and promote fuller engagement with the subject.

“The key thing about the site is that it is visual and stimulating; you can manipulate things on the screen while learning.”  
*UK Teacher B in evaluation of Virtual Victorians for ICT training course.*

The virtual, then, can also help scaffold users’ conceptual understanding of objects that they see in real life. Wood (Wood & Attfield 1996) supports the suggestion that the integration of knowledge and experience is a complex interaction of children’s play worlds, imaginary worlds, and real worlds. In the virtual learning domain, meaning is constructed between the object and the viewer, building upon the user’s own prior knowledge, experience, and beliefs and supported by the mediation of the virtual environment (Dillon & Prosser, 2003).

“Well I like it on the website because then you can eventually play [the instruments] on the web site but you can’t do that in the museum, but I’d like to play them properly, without having to do it on the website.”  
*Student L aged 7*

The findings from Burma and Virtual Victorians show that the virtual objects did not diminish but promoted an appreciation of the value of physical objects and of displaying them in museums. This runs counter to ‘folk mythology’ in the museum learning sector which asks “Why should anyone bother to visit a museum to see the actual artefact when virtual copies are so easy to come by?” (Leinhardt & Crowley, 2002, p302). Children who used both Virtual Victorians and Burma found their digital experience of the objects (manipulating them, interrogating them, using them, and enjoying them) was different from, but no less valid and meaningful than, their interaction with the real objects. The children in this study showed a deeper and subtler understanding of digital representations of objects in virtual museums than Leinhardt and Crowley suggest they might. Rather than finding these digital objects a watered down abstraction of the real, in terms of density of information, scale, authenticity and value, as Leinhardt and Crowley argue, the children in this study appreciated the opportunity for a genuine engagement with the object that added another dimension to their experience.

The children who participated in the Burma study visited the museum to see the Burmese Theatre Orchestra instruments midway through their project. It provoked much thinking about the quality of virtual objects on a WWW site compared to seeing them face-to-face. It consolidated the children’s perception of the fragility of the instruments and led them to consider the ability of the WWW to allow you to do things, for example play the instruments, which would not be possible in any other way. It led to an understanding of how objects are cared for, that is to say, use of gloves and acid-free tissue packing and, more significantly, the need to control access to the original artefact.

Student S, for example, reveals a subtle understanding of the value and role of digitisation in relation to fragile objects.

“I think I’ve learnt about some things, you can’t play in real life, you have to play it on a website and you have to record it and you can only play it once and then you can’t touch it anymore because otherwise it will just collapse.”

*Student S aged 7*

Student L reflects on the limitations of the virtual. She also implies that there is a difference between the way the viewer looks at the real object and a virtual representation of that object.

“I think it’s better to see them in the museum because then you can see them properly. You can’t see them really, really closely [on the website] – see what they look like properly. Well you can’t always guess what things are without looking at them properly. Because at first I thought the xylophone looks like a boat.”

*Student L aged 7*

Children as young as 7 can, even as first time net users, identify, develop and articulate sophisticated distinctions between the pros and cons of physical and virtual representations of objects. Users can compensate for shortcomings in the virtual experience by drawing upon their prior physical experiences (and other virtual experiences) and vice versa. This draws on the constructivist (Bruner 1966) and social development (Vygotsky 1978) theories of learning and their application to the contextual model of museum learning (Falk and Dierking, 2000). Falk and Dierking suggest that learning takes place in a series of contexts: the personal (which includes motivation and expectation, interest, prior knowledge and experience, choice and control), the physical (which includes advance preparation, setting, design and subsequent reinforcing events and experiences) and the socio-cultural (which includes within-group socio-cultural mediation and facilitated mediation by others). Such identification, understanding of, and compensation for the limitations of the virtual environment could be considered integral to the ‘willing suspension of disbelief’ phenomena in digital learning environments such as *Burma* and *Virtual Victorians*. There is a parallel to be found in Metz’s theories of film (Metz, 1975). Metz suggests the paradigmatic is missing from ‘film’ and this is what has to be supplied through the act of viewing. In doing so the spectator becomes an active part of the textual formations of the film. Forster suggests a similar phenomenon on the part of the reader of fiction,

“...in the novel we can know people perfectly, and, apart from the general pleasure of reading, we can find here a compensation for their dimness in life.” (Forster, 1974, p69)

In *Burma* and *Virtual Victorians*, the need to compensate for the shortcomings inherent in digital ‘surrogates’, binds the user more closely and actively into the digital learning environments, and adds cohesion to the learning experience.

The real and virtual visits appear to be reciprocally beneficial. Children were able to use their knowledge of objects in the physical world to help their understanding of the virtual representations of the museum objects. Teacher R also identified the way in which the children were stimulated to make critical comparisons between the Burmese instruments on the web site and their own school instruments. The virtual facilitated and stimulated this knowledge transfer into the physical.

“One of the real successes for me was the fact that they’ve actually transferred what they’ve heard on the website, seen what those instruments sound like and were able to select [from the classroom instruments] in the way they did, and create music which

actually has got quite an appropriate feel to it.”

*Teacher R*

Student S has combined both his real and virtual experience of the xylophone to synthesise his understanding and draw conclusions about real objects that he hasn't seen. The virtual learning experience seems to have increased his ability to conceptualise the real world.

“I like actually seeing the big xylophone... . It is very big and I haven't actually seen how big ... I haven't seen the drumsticks but I know, I think I know, what it'll be like to play them.”

*Student S aged 7*

## **Conclusion**

Virtual museums are held to be the future for museums in terms of increasing access and social inclusion (National Museum Director's Conference, 1999). If this is to be achieved then virtual museums have to be relevant and engaging. Many museums are failing themselves and their users by creating a digital pastiche of the physical museum rather than seizing the opportunity to extend and enhance the museum learning experience offered by effective use of ICT. ICT is capable of facilitating value-added learning interactions that are not possible in the physical museum.

In film technique 'the whole purpose is to stitch the spectator into the illusion' (Hayward, 2000). ICT can similarly transcend mere information and content delivery. By suspending disbelief you can enter the world of Virtual Victorians, use the objects they used, play with the toys they played with and even talk to them. In the Burma website you can play music on Burmese Theatre Orchestra instruments. This 'value added' experience distinguishes these sites from museum sites that merely put digitised objects and information online, extending physical but not cognitive and affective intellectual access.

By using objects as the means and not the end, rich, immersive environments can be created which encourage the 'willing suspension of disbelief' and creation of belief, in turn enabling virtual representations of the objects to be more satisfying and illuminating than mere two-dimensional representations. It enables children to move from a sense of wonder into meaningful engagement (Greenblatt, 1991) with the originating cultures and contexts.

Well-designed on-line learning activities will provide a framework that allows users to do this. The learning environment should add a personal dimension, extending engagement with the object through person-to-object interaction and person-to-person interaction (peer and virtual/knowledgeable other). It should encourage meaningful connections to be made by enabling the user to experience the context in which the objects would have originally been used. In this way the virtual learning experience model exemplified by Virtual Victorians and Burma can provide a fourth dimension, which compensates for the loss of readability of the virtual object compared with the real object in physical space. This fourth dimension allows the user to manipulate the object, engage with its originating context, and empathise with its owners, users and creators in a way that is not always as easily replicable in the physical museum.

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### **<sup>i</sup> KS1 (aged 5-7)**

From children in primary schools in:

- *England*: Blackpool, Chesterfield, Sevenoaks, Stockton on Tees
- *Scotland*: Leven

### **KS2 (aged 7-11)**

From children in primary schools in:

- *England*: London, Rochester, Ipswich, Dover, Coventry, Bracknell, York, Bromley, Evercreech Walsall, Brighton, Bexhill-on Sea, Leeds, Durham, Exeter, Halifax, Ashton-under-Lyne
- *Scotland*: Edinburgh, Falkirk,

### **KS3 (aged 11-14)**

From children in secondary schools in:

- *England*: Reading, Tiverton

**Adults** from:

- *England*: North Tyneside, Rochester, Gillingham, Portsmouth
- *Scotland*: Leven