



£5.00

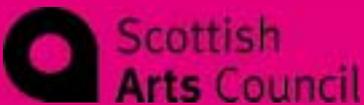


Space for Learning:

A Handbook for Education Spaces in Museums,
Heritage Sites and Discovery Centres



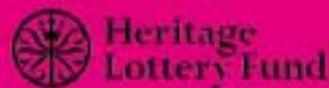
Published by:



cabe education



department for
education and skills



Space for Learning:

A Handbook for Education Spaces in Museums, Heritage Sites and Discovery Centres

'I would like a larger, dedicated space
which was accessible, light, bright, visible
and suitable for all kinds of work.'

Education Officer, Tyne & Wear Museums

Contents	Page
Foreword	2
Introduction	3
Topics:	
1. Activities to Consider	8
2. The Development Process	10
3. Working with Architects	11
4. Location & Dimensions of the Space	12
5. Planning for the Future	14
6. New Technologies	15
7. Fittings, Furniture & Equipment	16
8. Services	18
9. Costs	19
10. Storage & Display	20
11. Usage, Management & Maintenance	22
Case Studies:	
1. @Bristol	24
2. Bagshaw Museum	26
3. Bishops Wood Environmental Centre	28
4. Bolton Museum & Art Gallery	30
5. Dyrham Park	32
6. The Horniman Museum	34
7. The Lighthouse, Scotland's Centre for Architecture, Design and the City	36
8. The River & Rowing Museum	38
9. Techniquest Science Discovery Centre	40
10. Ulster Folk & Transport Museum	42
11. The Women's Library, London Metropolitan University	44
Where to Find Out More & Suppliers	46
Keyword Index	47
Favourite Spaces	48
Acknowledgements	49

Foreword

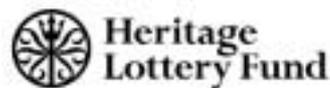
There are hundreds of education spaces within museums, historic buildings, heritage sites and discovery centres across the UK. Many more are planned in the context of an ever-increasing emphasis on these sites as cultural learning resources. Many have been – or will be – funded by some of the organisations listed below, yet few are built, furnished or developed with any clear guidance to hand. Many are inadequate and unsatisfactory – in terms of their dimensions, their location or their fixtures and fittings. Few realise their full potential as learning environments, with some succeeding only through the ingenuity and enthusiasm of the site's education team. Success is often mixed: rarely comprehensive. But this needn't always be the case.

This handbook aims to take the haphazardness out of the development of these spaces. It aims to inform, educate, advise and support staff, policy-makers, funders, architects and designers and to enable them to create high-quality, desirable spaces for learners of all ages, whatever their budgets. In the course of this handbook, we document many of the errors made in creating learning spaces – and we occasionally apportion blame – but we do so only to highlight the potential pitfalls and to lead readers towards creative solutions. We hope that education staff, project teams and architects will be able to use this handbook to guide their thinking – on both an individual and a collective basis – and to ensure that the best possible spaces can be created, whatever the particular set of circumstances or resources.

In researching this handbook, we struggled to find exemplar spaces to highlight best practice. We very much hope that in five years time, a similar survey will reveal a very different picture. But that's up to you. It will certainly help that this guidance is being published by a number of funders of learning spaces; a grant applicant would be unwise to ignore this handbook in submitting a bid for a learning space. Between us, we can make a difference.



department for
education and skills



cabe education



Introduction

Space for Learning is a collaborative research project, involving a partnership between key organisations concerned with education in the arts, cultural, environmental and heritage sectors: Arts Council England, Arts Council of Northern Ireland and the Scottish Arts Council, the Clore Duffield Foundation, the Commission for Architecture and the Built Environment (CABE) and the Design Commission for Wales (DCFW), the Department for Culture, Media and Sport (DCMS) and the Department for Education and Skills (DfES), the Heritage Lottery Fund (HLF) and the Museums, Libraries and Archives Council (MLA, formerly Resource).

These organisations came together because of their mutual concerns about, and ambitions for, education and for learning spaces in the institutions and sites for which they are responsible or which they fund and make use of. We recognise the value of working together as funders, advisers and users, and of the enhanced power of guidance that is jointly endorsed by such bodies.

Space for Learning has also been produced in consultation with hundreds of educators working within museums, archives and libraries, historic houses and buildings, heritage sites (industrial, archaeological and natural), architecture and science centres, children's museums and discovery centres across the UK.

The diverse nature of the institutions and sites with which we are concerned in this handbook means that, for simplicity and readability, we refer to them generically as 'sites'.

Many sites have inadequate and unsatisfactory learning spaces. They are too small, or in the wrong place, poorly fitted-out, or with inappropriate equipment. They are too dark, or too cold. Too many spaces fail to realise the potential of the learning opportunities that the site can offer; and too many senior management teams fail to appreciate the central role that education should play in the site's vision, work and future development.

The location, design and build quality of learning spaces in museum, discovery, environmental and heritage sites reflect the general lack of status of education as a discipline within such sites in the UK. Too often, education is regarded as a marketing tool rather than being seen as intrinsic to a core service. Too often, education is used as leverage to obtain additional funding for developments rather than being seen as intrinsic to the site's overall purpose. And too often, the head of education is not a member of a site's management team, so is therefore on the margins of the decision-making process.

'We are acutely aware that the spaces we are funding must be well-managed and well-programmed. We therefore take a critical interest in the relevant staffing structures. We have learned from experience that the spaces we fund will never realise their full potential for learning unless the head of education or learning is given a high level of authority in the relevant decision-making process, and is empowered to build the team necessary to deliver the enhanced programmes expected from the new space.' *Sally Bacon, Executive Director, The Clore Duffield Foundation*

Cultural sites need to see themselves as a whole learning space, where education takes place in the collection galleries and exhibition areas as well as in designated learning spaces. But without dedicated spaces, education will always be at a disadvantage and prone to marginalisation with no clear reference point for users or staff.

'... every part of the Museum is used – plus the education room ... we consider and use the galleries as education space.' *Principal Curator, Worthing Museum & Art Gallery*

'The Education Centre ... exists to support the educational work done on site and led by the teachers. It aims to encourage an understanding of the site itself, which is the real education centre.' *Regional Education Officer, South East Region, English Heritage*

It is not surprising that the UK has so few centres of excellence in these types of learning space. Many education staff say they do not have access to proper guidance and support in devising, negotiating, analysing and managing learning spaces. They want to know what is possible, what they can aspire to, what is available, and what they can afford.

Creating a successful, dedicated learning space helps both to raise the status of education across the site as a whole, and to make education users feel valued by the organisation. Before all else, sites must have an education policy in order even to attempt the creation of a learning space. They must know in advance what they want the space for, and they must know the learners for whom they intend to provide.

This handbook documents and gives practical guidance on best practice in the design, construction, rethinking, refurbishing, resourcing and management of learning spaces – large or small, old or new – across a range of cultural sites. We particularly want to encourage those working in less than ideal learning spaces. Our research highlights many inspirational and thoughtful solutions to rethinking and managing spaces where resources are limited and locations far from ideal.

Objectives and principles

Our main objective is to facilitate the creation of high-quality, flexible and sustainable learning spaces for the future. This guidance aims to inform, educate, advise and support not only staff, but also policy-makers and funders, architects and designers.

The *Space for Learning* research developed from the two-year *Space for Art* project devised, managed and funded by the Clore Duffield Foundation as part of its Artworks programme. That project looked specifically at art education spaces in galleries and schools.

For *Space for Learning* we have adopted six guiding principles (each of which is discussed below in more detail):

- value learning from experience
- cater for learners of all ages
- provide guidance relevant to all types of spaces
- create success, whatever the budget
- embrace the wider learning environment
- support the environmental sustainability of spaces

'... every part of the Museum is used – plus the education room ... we consider and use the galleries as education space.'

Principal Curator, Worthing Museum & Art Gallery

- 1 Bolton Museum & Art Gallery
- 2 The River & Rowing Museum



From the start, we determined that the research should be consultative and cover the whole of the UK. The partner organisations have also felt strongly that the guidance should be thoroughly endorsed and 'owned' by the sector we are seeking to assist; be forward-thinking and look to the long term; and be practical and flexible – allowing for variations in the scale of projects and the experience of staff.

Space for Learning has one simple but vital imperative: to ensure that all learning spaces can realise their full potential for users, and be the best possible space within the constraints of the particular set of circumstances or resources.

Whatever your circumstances, whatever budget you have for a learning space – a few million, a few hundred, or just some time to think afresh – this handbook will help you get the best out of your space.

Learning from experience

Best practice is developed by individuals and institutions grappling with reality: making mistakes and learning from them; thinking through issues and problems creatively and finding innovative solutions; meeting challenges through collaboration and exchanging ideas; taking risks; and using their imaginations. This handbook has drawn its evidence and developed its guidance by listening to, questioning and documenting those individuals and institutions who have devised best practice in just such ways. In effect, we offer practical rather than theoretical guidance (see *How we compiled the handbook*, p.5).

Learners of all ages

In this handbook we talk of *learning* and the *learning space*. In the context of an ever-increasing emphasis on sites as cultural learning resources, the perception of education is changing to one of learning: from a noun to a verb; from passive to active.

The case studies in the second half of this handbook highlight how formal and informal learning no longer have any age limits. Increasingly, cultural sites see their education work as territory for a wide range of learners, from groups of Key Stage 2 pupils to higher education students, and from early years groups to adult learners. This handbook therefore assumes that you may have many diverse groups of users, and that some – such as small children or learners with disabilities – have very particular requirements.

All this has obvious implications for the design of learning spaces. Much more can go on in them – making, investigating and exploring, listening and discussing – and with a range of equipment, from the traditional to new technologies. A space may also need to be compatible with sitting still as well as with being active.

As a result, learning spaces will take many different forms in order to meet the needs of the diverse groups and individuals who come to them – or who could come to them if suitably approached and attracted. Properly planned, one space can meet a wide range of needs – if not always every need. The key is flexibility.

These changes also require us to re-evaluate the nature of learning in museums, heritage and other sites. Such a process can help to raise the status of education and learning within the site; ensure that education staff are involved in and empowered by the process of developing or rethinking learning spaces, as well as managing them; and encourage a 'creative pedagogy' that embraces maximising the learning potential of site visits. It can also establish creative connections to the curriculum and beyond, as well as providing opportunities for the continuing professional development of teachers.

All types of spaces

Our concern is with large and small spaces, whether they are old, new or still in development. We accept that the task of a new-build learning space is very different from that of a refurbishment; that spaces in national museums are usually much more substantial than those in small, local ones. Yet a small-scale rethink or refurbishment demands as much care and attention to detail as a major new build. The difference is in scale and degree rather than importance or value. It is the potential of your space that matters, whatever the circumstances of that space. This handbook therefore discusses complex variables to apply generically, as well as general principles that can be applied to a wide range of circumstances.

Success, whatever your budget

We have talked to people across a wide range of sites in order to provide a comprehensive picture of the possibilities. For example, a national museum is usually better resourced than a small local-authority or university museum or environmental centre. Much can be learned from well-resourced learning spaces even if you are working on a much smaller scale or with far less funding available to you; the reverse can also apply when adversity proves to be the mother of invention. We may paint some ideal scenarios here and it can be helpful to do so. However, we fully acknowledge that while some of the desirable qualities of a learning space described in this handbook might be unattainable for you, others will not. **Your achievement will lie not in attaining the ideal, but in creating the best possible learning space within constraints and compromises that you cannot, at this stage, change.**

The wider learning environment

This handbook acknowledges that learning and exploration also take place beyond the boundaries of dedicated learning spaces – alongside artefacts, collections, exhibits and in outdoor environments such as pond-dipping and open-air discovery areas. However, it is important to have dedicated spaces for learning. A lack of such space limits the wide range of activities that should now comprise a rich learning programme that is relevant to a diversity of groups. Crucially, a properly located, dedicated space can give education work visibility and status within the site and among its visitors, which can lead to increasing interest and participation in the activities being offered.



'Learning is a process of active engagement with experience. It is what people do when they want to make sense of the world. It may involve the development or deepening of skills, knowledge, understanding, awareness, values, ideas and feelings, or an increase in the capacity to reflect. Effective learning leads to change, development and the desire to learn more.'

MLA definition as quoted in '*Inspiring Learning for All*'



The sustainability of spaces

The design and operation of learning spaces offer sites the opportunity to incorporate sustainability principles, particularly in the areas of use of natural resources, energy, waste management and recycling. An environmental centre would make sustainability a top priority, but there is a growing commitment by other types of site to adopt such solutions. An education team is in a good position to press for a sustainable approach, especially as most school children and teachers are very aware of these issues. In addition, environmentally sustainable features can be an educational attraction in their own right.

How we compiled the handbook

The contents of this handbook are based on the findings of a wide-ranging consultative exercise to gather data, experiences and opinions on the ideal learning space, and the realities of the spaces that already exist.

We carried out a survey, through an online questionnaire, of more than 100 cultural sites including the nationals (that is, institutions which receive funding from central government) and non-nationals (both local authority and independent). We asked about the main elements of their learning spaces and how they rated them across a range of practical criteria. Our analysis of the findings (see below) is based on responses from 91 non-national sites and 21 national sites. These sites comprise museums, historic houses and other architectural and industrial heritage locations, environmental centres, including nature and wetland reserves and parks, galleries and sculpture parks. (For a full list of questionnaire respondents, see p.49.)

In addition, detailed and illuminating findings came from 11 in-depth case studies of learning spaces at a range of small- and large-scale sites across the UK. These are in a mix of city, urban and rural locations, and run by commercial companies, private trusts or local authorities. They comprise the **Bishops Wood Environmental Centre** in the Worcestershire countryside; two science/discovery centres – **Techniquet** in Cardiff and **@Bristol** in that city's Harbourside redevelopment; the **Lighthouse, Scotland's Centre for Architecture, Design and the City**, in Glasgow; the National Trust historic house **Dyrham Park** near Bath; the **Women's Library, London Metropolitan University** in London's East End; and five very different museums: **Bagshaw Museum** in the small Yorkshire town of Batley, the larger-scale **Bolton Museum & Art Gallery**, the **Horniman Museum** in south-east London, the **River & Rowing Museum** at Henley-on-Thames, and the **Ulster Folk & Transport Museum** in Holywood, near Belfast.

Through a series of focus groups at each site, we drew on the views and experience, enthusiasms and criticisms of the key stakeholders in the spaces, including educators, senior management and other staff, teachers and other users of the space. In some cases, the architects who designed the learning space also attended the focus groups. There were lessons to learn from each site – both from their successes and from their failures as they built, rethought or refurbished their learning space. The groups also identified the key factors that determined the outcomes of the project.

The 11 case studies form the second half of this handbook and are also available (with a PDF file of this handbook and Word versions of the text) on the Clore Duffield Foundation's Artworks website: www.art-works.org.uk The quotations included in the text are taken from the questionnaires, focus groups and case studies.

The project was guided throughout by a Steering Group of experienced professionals drawn from the partner organisations involved in the *Space for Learning* project. (See *Acknowledgements*, p.49.)

The key findings

Our work on *Space for Art* and the responses from the *Space for Learning* survey both confirm and clarify the key factors that need to be considered when designing and equipping a learning space. They also give us a picture of the state of learning spaces across the UK.

For example, while most of the national sites are satisfied with the size of their learning space, half of the non-nationals definitely are not. Only just over a third of all sites have space that is exclusively for educational uses. Most spaces in national and non-national sites resemble a classroom, followed by a gallery or exhibition area. Critically, only a minority of spaces seem to be of sufficient size to accommodate a whole class of 30 children. The majority are located on the ground floor and accessed through the main gallery or exhibition area. However, access out of opening hours can be limited and, more seriously, is often inadequate for learners with physical disabilities.

Nationals tend to hide their learning spaces away from the general visitor by not locating them where they can readily be seen, whereas non-nationals do the opposite. However, non-nationals tend to dislike more the look and feel of their spaces, and half of both types of site have difficulties in keeping spaces clean and tidy.

The facilities in learning spaces must be able to manage efficiently the movement and physical needs of large groups of people, especially children. Yet, only a minority of sites consider their toilet facilities to be good enough in terms of numbers, accessibility and child-friendliness. Adequate space for lunch is a chronic problem for most sites, particularly non-nationals, as is cloakroom provision. Whether lockers, hooks, cloakrooms, wheelie bins or crates are used, over half of sites regard such provision as poor.

Storage space generally is also a problem for most sites, and the rectification of this is seen as a priority by many education staff. Over three-quarters of respondents are not satisfied with their storage space for work, resources and materials.

That cornerstone of services – the sink – continues to vex most education staff, and no doubt those who use them as well. We asked about the number, location, size and types of sink: two-thirds of respondents said that provision is poor or merely adequate, and 13% of non-national sites have no sink at all. Alarmingly, almost three-quarters of nationals report that their sink situation is not good.



1 & 3 The Horniman Museum	5 Dyrham Park
2 The River & Rowing Museum	6 Ulster Folk & Transport Museum
4 Techniquet Science Discovery Centre	7 Bolton Museum & Art Gallery

Access to power points is satisfactory, but the location of other services such as water and lighting is less pleasing for two-thirds of the non-nationals. The quality of natural and artificial light is also better for nationals than non-nationals, as are blackout facilities – not good enough for 58% of them.

Other important aspects of a well-designed and well-fitted learning space include acoustics and sound-proofing, temperature control, and floor covering. Of these, sound-proofing and temperature control are particularly problematic for the majority of sites, being good in just one in five and one in four respectively. By contrast, almost half are satisfied with a space's acoustics and its floor covering.

There are several factors to take into account when deciding on furniture and equipment: the quantity you need, the type and size, and the design. Most respondents regard their tables and chairs as adequate rather than good. But such items also have to suit different ages and sizes of users, and be easy to move and store. Here there is less satisfaction with furniture's adaptability, with only one in five sites defining this as good. As for moving and storing, one in four has problems with furniture and one in six with equipment.

One of the most worrying findings is the limited access that the majority of sites, both national and non-national, have to ICT equipment and the Internet. Half of non-nationals say that access is poor; 15% have no access at all. Even for the nationals, around 50% of sites have poor access, and only a minority of both types of site benefit from effective technical assistance. This sorry state of affairs is reinforced when we look at the curriculum areas and activities that sites can offer.

One in five say that offering ICT is impossible, and only one in eight can offer Internet access to learners.

From the survey of cultural sites, we found that three-quarters are housed in listed buildings – a significant factor in the redevelopment of sites or internal spaces. The annual number of visitors ranges from 2,000 to 4.5 million, and educational participants from a hundred to half a million. The responses from this variety of site highlight both the diverse nature of learning activities and contexts, and the common factors in what makes a successful learning space.

Getting the process right

In this handbook, we identify and explain the three core elements of a successful development process: communication, consultation and collaboration. We consider this in detail in the chapter on *The Development Process*, see p.10. However, there is one aspect that we want to highlight here: consulting with children and young people.

The difficulty is how to carry out a successful, meaningful and useful consultation. It is not simply a question of asking young people what they want from a space – how could they know what is possible? There is also the issue of managing expectations: young people may make creative suggestions that cannot be implemented because of budget or staffing restrictions. And there is the temptation to listen only to the 'easy kids', the vocal and verbal ones who are used to being heard; they may not be representative, they may just say what they think you want them to say, or they may simply describe what they have seen elsewhere.

Consulting young people therefore requires specialist skills and experience, and a growing number of organisations such as Play Train now work with young people on major cultural and policy initiatives. While many museums and other sites may feel that they cannot afford to consult children and young people using specialist researchers, there are other sources of potential help and support. For example:

- Talk to your architects about their experience of consulting users – they may have unexpected skills and experience in this area!
- Talk to the teachers and tutors of educational groups who regularly use your spaces and see what they think. They may have ideas about how to research the potential of the space with the young people with whom they work
- Research website and other documentation on recent examples of consultations for projects such as the development of the New Art Gallery in Walsall, the Discover Centre in East London and the MacRoberts Arts Centre at Stirling University in Scotland

(See also *Where to Find Out More*, p.46.)

Space for Learning is one of several mutually supportive advocacy tools that have recently become available. DCMS and DfES are publishing a joint museums and galleries strategy together with documents on the potential for built environment education.

The Museums, Libraries and Archives Council (MLA, formerly Resource) has issued *Inspiring Learning for All* as a web-based resource – www.inspiringlearningforall.gov.uk – enabling museums, libraries and archives to review and develop learning activities based on a framework of best practice and to measure their impact on learners. The Attingham Trust *Opening Doors* report will focus on learning and the historic built environment in the UK.

This is a pivotal, and exciting, time for learning in museums and other cultural sites, and especially for the development of the spaces within which that learning can take place. We want this handbook to facilitate the creation of high-quality, desirable learning spaces by empowering educators and learners. The findings from our case studies and questionnaires reveal how too many are still having to accept makeshift or unsuitable conditions for the old, and even new, environments in which they work.

There is therefore much to do, and many attitudes to change. The most effective way to make those changes is by having well-informed and empowered education staff who can, in turn, engage and persuade their directors, trustees, funders, architects and contractors when the time comes to rethink, refurbish or rebuild their learning space.

The advice and guidance, views and experiences documented in this handbook will help this process. Our aim is that the principles underlying the handbook will become commonplace across the UK's cultural sites. We know it can be done because much of the material has been gathered from those already putting those principles into practice. The few can become the many. It's up to you to make the next move.



1
Ulster Folk & Transport Museum
2 & 4
Bishops Wood Environmental Centre
3
Bolton Museum & Art Gallery



Topics ...



Activities to Consider

'We are only restricted in subject by our collections and exhibitions (and time!).' *Education Manager, Reading Museum Service*

'... the room itself is a "blank canvas" – access is facilitated by the activities themselves.' *Assistant Community History Curator, Walsall Museum*

A learning space has to accommodate the activities you want to offer users. Such 'fitness for purpose' must be a constant theme when rethinking your space, and throughout the design and fitting-out phases of a refurbishment or new build. You need to consider the areas of the curriculum and the types of activity to be covered. Additional factors to address include age ranges and the size of groups you want to cater for. For example, early years groups and adult groups require different approaches in terms of activities and facilities.

Our survey of national and non-national sites shows that many find their learning space restricts, and sometimes prevents, the development of certain activities and areas of the curriculum. When asked what they can offer and what they find difficult, or even impossible, to provide, sites said that the more practical the activity, the harder it is to accommodate that activity in the space. Such areas include art & design, design & technology, and science. Similarly, the greater the need for specialist equipment or fittings, the less likely it is that a curriculum area can be provided – for example, ICT, PE, dance, and music.

It is not that such activities cannot or should not therefore be offered: rather, that during the development process for a rethought, refurbished or new space, the education team should identify – and, for any new build, discuss with the project team and the architect – those activities and areas of the curriculum they intend to offer and the design and fitting-out requirements for doing so.

One vital consideration is how well a learning space can accommodate different learning styles. From our survey, it seems that sites can successfully support both formal and informal learning, but practical learning is more difficult. More problematic still is providing for the individual, self-directed learner or researcher. The facilities of a space largely determine the success or otherwise of catering for diverse learning styles. However, just as crucial are the look, feel and culture of the learning space. Is it a comfortable or sympathetic place to be for encouraging each kind of learning?

'The title "Lecture Room" on the door provokes negative comments and feelings from older children, although the paintings in the room incite the curiosity of all children. Carpeting and paintings on the walls limit capacity for messy activities.' *Museum Educator, Anon*

The areas of the curriculum covered by a site depend in part on the nature of its collection(s) or activities, and its level of specialisation – for example, if it is a science or environmental centre. Few sites are able to offer all areas of the curriculum, nor would many wish to. It is important therefore to agree priorities for what to provide, and to ensure that there is sufficient flexibility in the physical elements of the learning space to introduce new themes and activities in the future.

The limiting factors relate mainly to the learning space itself, such as size, location and equipment. In addition, a site must assess the number, resources and expertise of its education and support staff who will be expected to provide and manage the range of activities and subject-matter.

'There has been a restructure of the Museum and more staff given to the education team. A priority is to develop new activities.' *Head of Learning, Natural History Museum, London*

'We are only restricted in subject by our collections and exhibitions (and time!).'

Education Manager, Reading Museum Service



- | | |
|---|---|
| 1
The Horniman
Museum | 6
Dyrham Park |
| 2
The Women's Library | 9
Bolton Museum &
Art Gallery |
| 3 & 11
@Bristol | 10
The Horniman
Museum |
| 4, 5, 7 & 8
The River & Rowing
Museum | 12
Ulster Folk &
Transport Museum |

'... the room itself is a "blank canvas" – access is facilitated by the activities themselves.'

Assistant Community History Curator, Walsall Museum

Demand from schools also determines what a site sets out to offer. This is confirmed by our survey, which shows a common spread of curriculum areas being offered by both generalist and specialist sites. For example, history – including social, local and living history – art & design, and science are most frequently offered. Some way behind, but still common, are areas like architecture, citizenship, craft, creativity or creative development, design & technology, English and literacy, environmental studies and education for sustainable development, and geography.

However, few sites explore the potential of such key areas as maths, numeracy and modern foreign languages. These require no specialist equipment – merely a fresh approach. Even supposedly hard-to-accommodate activities like video, dance and music might be introduced more widely if related to the site's collections in exciting ways. Such activities may appeal to schools seeking new approaches to key areas of an expanding curriculum.

'I do not feel I am unable to do anything totally because of the room – though art and craft work is quite a hassle as a result. But the carpets are really good (and the underfloor heating) and many of the little children really like sitting on it – creating a really good informal non-school atmosphere.'

Education Officer, National Wetlands Centre, Llanelli, Wales



The Development Process

'Functionality is the main goal for learning spaces.' *Museum Educator, Anon*

The development process for a proposed new or refurbished space – or where you are just trying to make the best of your existing space – can be summed up as 'the three Cs': communication, consultation, collaboration. Whoever is heading the project must ensure that all three happen.

This process by which a learning space is developed is as important to get right as its location and what goes inside it. Who helps to make the decisions and how those decisions are made determine the kind of space you will end up with. If the education team is not properly involved in this, the odds are you will not get the space you want – nor the fittings, furnishing and equipment you need to run successful programmes.

'Make sure you and your entire team, and potential users of the space, are involved ... Ensure that directors are clear about who the space is for – is it likely to get overshadowed by the need to bring in revenue and be used for corporate hire/events?' *Museum Educator, Anon*

Forming a project team

Whatever the type or size of project, form a 'project team' – even if it is just you and a colleague. This enables you to share ideas and responsibilities, and sends the message that you mean business. The more ambitious the project, the larger the team; and in a listed building, the team should include a conservation officer. The head of education should always have a central role in any team's decision-making process.

With a new build or major refurbishment, the team should appoint a project champion or leader to:

- act as the main conduit for all information and documentation between architect(s) and the site
- establish and manage effective liaison and consultation internally, including with building and conservation staff

- manage the different lines of decision-making with external bodies such as trustees, owners and funders
- maintain continuity throughout the project, especially in the light of staff changes
- agree timetables that suit the demands on the staff as well as the architects
- ensure that the different teams on the site, such as education or curatorial staff, have access to and can negotiate on those elements of the development that directly affect their work

The project team should itself reflect the three Cs, as well as setting up straightforward and transparent arrangements for keeping all staff up to date, having consultation sessions at key points, and ensuring that staff work together rather than in isolation. The project leader's role will sometimes be that of a referee ensuring fair play and bringing new players on to the field.

At one site, different teams (such as education and visitor services) were asked to specify what they wanted in terms of spaces and what should be in them. Drawings and descriptions were circulated for comment and amendment at the two key stages of applying for planning permission and agreeing the detailed designs. The teams were also brought in to discuss specific aspects of the development that affected their future work.

No team can embrace all the professional and practical know-how that is required to create a successful learning space. The project team, and the different teams, should therefore draw on the knowledge, experience and expertise of particular individuals either internally or from outside. It might be a good idea to establish sub-groups to research and develop specific aspects of the space, like access.

As emphasised above, it is vital to consult with the users of the learning space, and of the site as a whole. The education team should ensure that its actual and potential users are consulted in some effective way: this includes children and young people. Look for ways to do this based on practical involvement in developing the space. For example, children can help to work out whether the proposed space is the right size for the numbers and activities envisaged. One site got each education team member to act as an advocate for the different audiences it served, and consulted informally with local contacts and community networks.

The stronger the team, the more you will be able to question and propose on equal terms with other senior management, architect(s) and contractor(s). That will help you to steer the direction of the new space according to your imperatives rather than be driven by theirs.

'... the devil is always in the detail and ... that requires a much more collaborative approach.' *Paul Mainds, Chief Executive, The River & Rowing Museum, Henley-on-Thames*

Get involved

Whatever the scope of the project – from rethink to new build – carry out these three tasks:

Check out the building: If you are working in an historic, listed building with a management plan, do you know the implications for the siting, size or fitting-out of the kind of learning space you want? Talk to buildings and conservation staff.

Agree on whom the space is for: For example, is it for a broad range of users, for specific types of user, for the staff who work with them – or all three? This exercise will also help you to define what *you* mean by a successful space rather than what others – such as trustees, senior management, funders or architects – might mean.

Do the research: Visit other sites with learning spaces that interest you. Ask how they went about rethinking or refurbishing the space. With any new build, find out what other spaces the chosen architects have designed. Become familiar with the technical jargon and culture of architecture. Learn to read and interpret architectural drawings (see *Where to Find Out More*, p.46).

'We used a 3D model to test the logistics of the "get ins" and "get outs" of the number of groups visiting each day. This helped us plan the layout of furniture and understand the capacity of the spaces for different activities. 2D plans can be hard to follow and models can provide a more accessible and faster consultation format.' *Carolyn Roberts, Head of Education, Horniman Museum, London*

Changing circumstances

A key test for any project is how you respond when budgets are cut or problems arise over locations and dimensions. The clear and coherent framework established by the Horniman Museum is a useful model here, although the project team crucially did not include the head of education. They were able to cope with a 20% cut in the funding available for the Museum's redevelopment. Spaces were smaller but quality was maintained and a 'better building' resulted because of the team's ability to 'just think harder about what we really wanted and be more creative about the design'.

In such circumstances the value of the three Cs comes into play even more, because they allow teams to focus on the practical side of an enforced rethink – as at Bolton Museum & Art Gallery, where 'the education team met to discuss priorities. It was decided that access to water and a floor to be messy on were the essentials, and that the space could do without a fitted screen to separate it from the rest of the gallery'.

'Talking to people helped us build a vision of what it should look like and how it should be built.' *Dave Millis, Architect, Bishops Wood Environmental Centre, Worcestershire*

'... the devil is always in the detail and ... that requires a much more collaborative approach.'

Paul Mainds, Chief Executive, River & Rowing Museum, Henley-on-Thames



Working with Architects

'When it came to briefing the architectural team, we knew what we wanted from the building but not what it might look like. That was the architects' job.' *John Rhymmer, Director, Bishops Wood Environmental Centre, Worcestershire*

Architects may only be brought in for new-build projects and are not always involved in rethinking or refurbishing a learning space. When they are, the three Cs of communication, consultation and collaboration apply equally to them. The most successful new or refurbished learning spaces – whatever the size – have come about from a close understanding between client and architect of what is needed. That means talking and listening, as well as designing.

Where you do just have a space to rethink or reshape, and little money with which to make changes, you may well feel that some architectural or design advice or expertise would help. If so, this might come informally from within – for example, from the trustees, the site's friends, regular visitors, or local authority and other networks. (For guidance on how to find an architect, see CAFE's *Creating Excellent Buildings: A Guide for Clients in Where to Find Out More*, p.46.)

It is the individuals involved, and their ability to collaborate effectively, that determine the success of the client/architect relationship. This means understanding each other's approach and needs in terms of designing and fitting-out the space; and identifying and acknowledging gaps in expertise or knowledge of both client and architect.

When an architect is on board, your task is to decide what is needed and provide a 'starter brief' as a guide. The architect's task is to add value, and some magic, to that brief and to the eventual space. Your *joint* task is to come up with the final brief that will deliver what the client wants and the architect can design. In short, it is a two-way process. How can that be achieved? Four of our case studies in particular highlight how this process works: Bishops Wood Environmental Centre, the Horniman Museum, the River & Rowing Museum, and the Women's Library.

Our case studies show that it is best to have one person to act as the main link between staff and architects. Establish regular and straightforward ways for staff to consult together. How this is done depends on your site's culture and staffing structure, but bear in mind the following three crucial points:

- Do not to allow hierarchies to restrict the involvement of the education team in the consultation and decision-making processes – whatever the size of the project. Our work with a wide range of sites highlights that the head of education should always be part of the senior management team, and be seen as a key player in planning any learning space project
- Ensure that everyone is involved in the consultation process in ways that are effective, transparent and trusting
- Make certain that everyone understands what is being proposed. Explain technical terms and architectural drawings and jargon. Always say when you don't understand something. Finbarr Whooley, Horniman Museum's Head of Curatorial & Public Services, comments: 'One difficulty was interpreting complex drawings. So we always tried to ensure that they were understood. Even so, people sometimes didn't take things seriously until they saw it in reality. That didn't really happen with the education team because they crawled all over the plans!'

Don't expect architects to know everything about your learning activities and their requirements; insist on additional expertise being brought in where necessary. In some cases, the architect researches and develops the learning aspects of the new or refurbished space: such an approach can provide new insights into its location, shape and content. Paul Swart, architect for the redevelopment of the learning space in the River & Rowing Museum, says that experience in educational settings is vital:

'You need to have been through a few temporary classrooms and Primary school extensions to learn the nitty gritty ... there's not a lot of architecture in some of these things and you don't want to have it, in a way; you want to suit the children first.'

Your first job is to ensure that the right people talk to the architects. This is particularly important when those running a site are not commissioning the new building or space themselves. For example, Techniquist Director Colin Johnson explains: 'Realising they did not have the operational experience of such a centre, the Corporation [Cardiff Bay Development Corporation] told the architects that while they were the client in one sense, the functioning client was Techniquist. We had a series of meetings and brought in people to refine our mission and sat down with the architects and looked at the details and how to match the needs with the budget available.'

A vital ingredient, both for you and for any architect involved, is always to show commitment to the project. This helps to maintain momentum, sustain morale within the organisation, and cement the client/architect relationship.

'If you have an enthusiastic client, the building reflects that. If you get clients who don't know what they want, you have problems.' *Dave Millis, Architect, Bishops Wood Environmental Centre, Worcestershire*

Some of the architects we spoke to listed the following key issues to consider when designing a new or refurbished learning space:

Developing the brief

- What activities do you want to carry out in the space?
- What effects will these have on the exhibition/display space?
- What is the best environment for these activities? Focus on the activities and avoid trying to cater for every possible option
- Do you want the learning space to be adjacent to or located within the display of artefacts? Consider the interest created by such a location, but also the potential risks to the artefacts (see *Location & Dimensions of the Space*, p.12).

Working together

- Ask the architect or project manager to write or adapt the brief based on your detailed requirements
- Refine and agree the final brief together
- Appoint a 'project champion' – someone who has the passion and energy to drive the project forward
- Build in a mechanism for reinvigorating the process – have set-date periodic reviews
- Revisit and amend aspirations to ensure that the project is achievable; this will help keep people focused
- Maintain and support the involvement of those who will use and manage the space
- Ask the design team to be flexible and accountable; hold them to what is agreed
- Expect and allow for the growth or reduction of funds and ambition
- Trust in the relationship with the architect
- Respect the use of each other's time

The key question to address together throughout is: Will the learning space work the way you want it to?



1 & 5
The Horniman Museum
2
Bolton Museum & Art Gallery
3
Techniquist Science Discovery Centre
4
The Women's Library



Location & Dimensions of the Space

The first questions when rethinking a learning space are:

- Is it located in the right place?
- Is it the size we want?

If the answer is no in either or both cases, consider the possibility of relocating to a different space, or reshaping the existing one.

For a proposed new space, consider:

- Where should it be located?
- What size should it be?

To answer these questions, address – and consult on – such issues as:

- What do we want to do in the space?
- How many different types of activity do we want to offer?
- What areas do we want within the overall space (e.g. teaching and non-teaching, offices, toilets, reception area, lunch area)?
- How often will the space be used?
- How many children or adults do we want to cater for in a group?
- How many people will be involved overall?
- Based on the above, how much space do we need?

- Where do we want the space to be, in relation to other spaces in the site (e.g. exhibition areas, staff offices, café or shop, gardens or dedicated outdoor areas, toilet facilities if not exclusive to the learning space, main entrance or a separate entrance)?

- Do we want the space to be situated in a central, public and highly visible location?

The site as a whole has a huge influence on the location and dimensions of the learning space within it, in terms of its own geographical location, structure and shape. That influence extends to perceptions of learning in cultural sites. For example, the view that the whole site is a learning space may be valid but can also limit a site's thinking about what a dedicated learning space should be for and where it should be. This is another justification for having an educational presence at senior management level, and on any project team for developing such spaces.

At the same time, compromises have to be made for the simple reason that a fully flexible, useable space is so difficult to design or rethink because something is always at the expense of something else.

In addition, disadvantages relating to the location, structure and shape of the site as a whole can create problems for or limit the potential of any new learning spaces within it. This can be particularly challenging with a listed building where conservation issues need to be considered and where innovation and radical thinking may be required more than for a brand new site.

'Dimensions were controlled by the original building, as were the accessibility and location.'
Museum Educator, Anon

Related to this is the need to build flexibility into a space, in terms of types of use and future development.

The continuing adaptability of the building is due to the design and layout of spaces being carefully thought about at the start. (Extract from the Techniqest case study)

Such problems should be addressed collaboratively between education team and project team – and any architectural team – in order to deliver a space that adheres as closely as possible to the agreed brief. Taking the time to understand the issues of location and dimension, and being helped to appreciate these, can enable the education team to resolve many difficulties in acceptable ways.

Most learning spaces in non-national sites are located on the ground floor, with others tending to be either on the first floor or in the basement. National sites tend to favour basement locations for learning spaces. This can create problems of light levels as well as diminishing the visibility and status of education in the site. Each site must decide which floor best suits its own space. However, one crucial issue is accessibility. If a space is located above or below ground level, make sure there are lifts of a sufficient capacity to move people to and from that level quickly and easily.

Putting spaces together

Work out which areas need to be adjacent to one another. Decide if you want the learning space to be next to or within an exhibition or gallery area. For example, at the Lighthouse in Glasgow, the education offices are easily accessible from the Education Workshop space.

'Press for as much space as possible. Children, especially, are not second-class citizens and shouldn't be squeezed into a corner.'

Museum Educator, Anon



This allows education and technical support staff to readily interact with workshop participants. At the Women's Library in London's Whitechapel, the exhibition hall includes two education spaces, one enclosed within it and the other above on a mezzanine level. This enables workshop participants to move easily between their own work and the reference material.

Working out dimensions

Getting the dimensions of a space right is as important as determining the right location – and sometimes more so. The fundamental issue is to make sure you have enough space to cater for the group numbers you want, especially with Primary-age children. Our research for *Space for Learning*, and previously for *Space for Art*, suggests that the minimum space allocation per person should be 2.8m² – this is more than the DfES recommends for school spaces, but it is based on real experience in a range of sites. This space allocation means that for a class of 30 children, any space should be a minimum of 84m². Our survey of sites reveals that more than half are unhappy with the size of their learning spaces. The size of spaces identified in the survey ranged from as small as 7m², with an average size of 45m².

Architects, and even a site's own senior management, often fail to understand the space requirements for a class of 30 children. Consequently, many learning spaces can cater for only half that number. **One site spoke of the 'flawed logic' in the original plan of assuming that the learning spaces need only cater for half a class at a time.** This is a crucial issue and you should not agree a space's dimensions until you are satisfied that it is large enough for your needs; cost saving on space just generates additional costs in management and staffing.

Some architects appreciate the importance of sufficient space. Paul Swart, the architect redeveloping the River & Rowing Museum's learning space, observed lessons in action to see how children move around and use a space. Test this out yourself. Involve users and staff to check how many people can fit into the proposed space; move equipment and furniture in and around to see what is possible, and how much circulation space and accessibility you will have. Use chalk marks on the floor and draw circulation maps so that architects and senior managers can actually see how people work in and move around the defined space. If the space allocated is not going to work, use the evidence from your 'test run' to justify and press for more space.

'Ideas for the design came from seeing what [the children] do and how they move through and around a building; how they use their eyes and senses.'
Dave Millis, Architect, Bishops Wood Environmental Centre, Worcestershire

Whatever size you have, or are allocated, consider the following:

- Opportunities for display
- Quality and level of available light
- Views outside the space
- Access to an outside space for activities and/or lunch area
- Ready access to basic services
- Level of external noise
- Easy access to toilets and potential lunch area
- Easy or dedicated access from the street
- Accessibility out of hours
- Opportunities for flexibility, adaptability and expansion
- Maximum number likely to use the space in a single session and over a year
- Amount of specialist equipment or furniture required

- Range of activities and type of work to be offered
- Amount of storage required for equipment, materials, and users' work
- Whether you need separate spaces for different purposes, e.g. dark room, or a handling area for valuable artefacts

Check out what is possible within the allocated space. For example:

- Will every part of the learning space be accessible to all?
- How many people can work in it comfortably at the same time?
- How difficult will it be to move around in the space?
- What equipment and furniture can be accommodated within the space?
- Which activities can be run, and which cannot?
- How quickly will staff and users get a sense of how the space works?
- Will you have enough education and support staff to service the space?



'Ideas for the design came from seeing what [the children] do and how they move through and around a building; how they use their eyes and senses.'

Dave Millis, Architect, Bishops Wood Environmental Centre, Worcestershire



- | | |
|---------------------------|-------------------------------------|
| 1 & 4 | 6, 8, 9 & 10 |
| The Women's Library | Bolton Museum & Art Gallery |
| 2 & 11 | 7 |
| The Horniman Museum | Technquest Science Discovery Centre |
| 3 | 12 |
| Bagshaw Museum | Ulster Folk & Transport Museum |
| 5 | |
| The River & Rowing Museum | |



Planning for the Future

Whether your project is to rethink, refurbish or build a learning space, it is essential that you explore – from the very start – how you might incorporate the ability to adapt to changing circumstances and/or demand. You need to be able to do this quickly, economically and successfully when the time comes.

In planning for the future, your first steps should be to:

- rethink or locate the space with the possibility of future extension in mind
- install electricity, water and other services with the option to 'open up' those services at any feasible point within the space, and even beyond it, through comprehensive wiring, trunking and piping
- where possible, use fittings, furniture, equipment and materials which can be reused or resited in any expansion or reorganisation of the learning space

The River & Rowing Museum found that after just five years with a new learning space, demand meant that a second space was required. The education team, other Museum staff and architect are engaged in 'healthy debates' about what they want to do and why. They are drawing on the mistakes as well as the successes of the first development, and focusing on an attention to detail which has only come from understanding and learning from the previous development process.

Planning for the future also means learning from experience. For example:

- What hasn't worked?
- Where are there gaps in facilities?
- Are there aspects of the learning space that do not suit specific groups?
- Are there barriers to supporting particular learning styles?
- Is the space unable to deliver new educational or cultural policies?
- Are there opportunities for expansion?

Because of its location, Techniquest has an inbuilt inflexibility: any redevelopment can only be upwards on top of the existing building. This has implications for the uses that can be made of higher floors in terms of education and exhibition space. However, the building has evolved and changed internally by rethinking spaces that are not working, agreeing a set of priorities for the use of spaces, establishing good organisation, and having knowledgeable, collaborative and watchful staff. This does not fulfil all future needs but it enables the site to progress rather than stagnate.

Site staff, education teams, funders and architects need to research and agree how best to design and equip learning spaces to meet the three challenges of:

- adapting to a site's developing vision and programmes
 - catering for technological advances
 - responding to new trends in educational and interpretative thinking
- More specifically, sites might consider how to respond to:
- support for diverse learning styles
 - new developments by institutions and sites as a whole
 - extending and improving the quality and variety of activities that can be offered
 - enlarging and redeveloping learning spaces and their facilities
 - making the site more accessible and relevant to a wider range of people
 - advances in e-learning and digital technology
 - developments across particular learning phases, including lifelong learning
 - government strategies and policies for the cultural sector, e.g. *Inspiring Learning for All* and *Culture Online*
 - government funding linked to specific social or educational strategies

Institutions themselves change in terms of what they do and whom they see as their users. This can lead to any built-in flexibility and multi-use having a limit or 'break point' because of the complex organisation required, the subsequent unsuitability of spaces for newly required activities, and a loss of clarity about just what a space is for.

For example, the Women's Library is facing such challenges head-on, with new alliances being forged between those staff not in at the beginning and the original architects. **Understanding what is happening and why can enable a site to address effectively the tensions and complexities of a brief that continues to evolve and to be rethought long after the building is complete.** Significantly, this can often be done for little cost and with only minor upheaval. It requires a fresh and critical look at a learning space, identifying and realising its potential.



1, 2 & 5
Bolton Museum & Art Gallery

3
The Lighthouse

4
@Bristol

6
The Women's Library

7
Ulster Folk & Transport Museum



New Technologies

Consider whether to invest in new technologies for your learning space. Ask the following questions:

- Why do we want it?
- Is it essential to our vision and our programmes?
- Will we receive ready and sufficient technical assistance?
- Will we be able to match or surpass what schools can offer?
- Will we be able to upgrade regularly?
- Will it help us to make better use of our resources?
- Can we afford it in terms of initial installation, running costs, and upgrading?

Despite numerous government initiatives, access to ICT remains restricted across museums and other cultural and environmental sites, according to our surveys in 2002 and 2003. Most sites say that access is poor, and 15% of non-nationals have no access at all. Some sites want it but cannot afford it.

The education staff would very much like to be able to provide computers and Internet access, but this is an area where facilities in the Museum as a whole are severely limited – the education team have a joint email address and Internet access from only one computer. (Extract from the Ulster Folk & Transport Museum case study)

Other sites have decided that ICT does not suit the work they do, nor the vision they have for their learning space.

However, some sites do build an ICT or e-learning requirement into the design and fitting-out brief for a new space, or ensure that the space is wired up for potential future development. The Technquest science centre finds that technological improvements are making it easier, in practical or building terms, to upgrade infrastructure and facilities. Everything is getting smaller.

When deciding on the provision of technologies which support teaching and learning – including televisions, videos, whiteboards and plasma screens – it is vital to ensure that the location of the equipment in a space does not restrict use for other learning activities. Equipment needs to be used as flexibly as possible, but always bearing in mind the need for security.

Those with limited resources often install only a modest level of facilities or put off going down the ICT route altogether. They argue that it is wiser to focus on what the site can offer that is different or unique rather than compete, largely unsuccessfully, with schools. One head of education explains that 'it is handling objects that is important because you can do that here but not in the classroom'.

Others, like Bishops Wood, consider that it is better to use new technologies to reach beyond the learning space itself – to provide preparation opportunities before visits, and continuing resources for learners through weblinks and downloadable materials.

The science centre @Bristol sees part of its future as extending interactive opportunities internally, and developing more sophisticated links between the centre and learning individuals and groups in schools and elsewhere through broadband technology, video webcasting and conferencing.

Where to start

When planning for new technologies, consider the following:

- How compatible is your building with new technology installation and use? Identify any problems with the building's structure

Access to the Internet is limited by the structure of the building, which has exposed concrete ceilings and no grids or holes for cables. (Extract from the River & Rowing Museum case study)

- What arrangements best suit you and your users? Consult users as well as staff and ICT experts
- Do you have sufficient space for what you want? Assess the space required for your needs and the options available for installation
- Can you afford the type and level of facilities that will deliver what you want? Decide the type and amount of equipment and networks you want, e.g. monitors, laptops, broadband or wireless facility, whiteboards, scanners, colour printers, and software. Acquire estimates of the costs involved in constructing or refurbishing an ICT space, buying the equipment, installing and maintaining it

- Does your space allow for adaptability and future change? Plan the infrastructure, such as building design, whole site networking, and trunking routes, to allow for spare capacity and the opportunity to extend and upgrade facilities

- Do you want a separate ICT suite or integration with the learning space? Discuss why, and where, you want ICT facilities

- Would you prefer the mobility and flexibility of laptops? Assess the need for and extent of security measures

The property manager was previously facilities manager in a large Secondary school and knew from experience the need to over-specify in terms of cabling by 400%. (Extract from the River & Rowing Museum case study)

The Lighthouse incorporated new technologies into its Education Workshop from the start. The brief required a multi-functional facility for hands-on learning, e-learning and reflective learning. The result is a large, rectangular room with high windows along one side providing good natural light. It can accommodate up to 60 school-aged students. A bench runs along the length of the windows to house Apple Mac computers. An overhead power track and wall-mounted sockets ensure that computers and electrical equipment can be used flexibly in the space. The space has coped with the growth of computer-based work well beyond the original plans four years ago. An increase in computers in the Workshop has been supplemented by a mobile computer trolley housing ten i-books.



The property manager was previously facilities manager in a large Secondary school and knew from experience the need to over-specify in terms of cabling by 400%.

Extract from the River & Rowing Museum case study

'When classes come here ... they're not here to look at a computer, they want to see the real thing.'

David Blair, Freelance Educator, Bolton Museum & Art Gallery



Fittings, Furniture & Equipment

The process of 'fitting out' any learning space – rethought, refurbished or new – is as crucial as its location and dimensions. The fit-out can determine the type and extent of activities you can offer, and make all the difference between an agreeable and manageable working environment and one that just makes life hard.

'Fitting out' involves choosing the right sort of furniture, fittings and equipment for your specific needs and those of your various users, and at a price that suits your budget – from sinks to chairs and tables, floor coverings to blinds, power points to what you plug into them.

The wall opposite the windows is fitted with full-length wooden cupboards used for storing tables, school bags, and art & design resources. The wood is solid and well finished. The sink area was made to order, by a firm specialising in fittings for prisons, constructed of industrial stainless steel housing two sinks, one 'child height' and the other for adults. There are large steel cupboards on either side of the sink and kitchen-style cupboards above. (Extract from the Lighthouse case study)

It comes down to five basic decisions: what to have, what type to have, how many to have, how much to spend, and where to locate them. Attention to detail is at the heart of effective fitting-out: it requires good research, effective consultation, learning from experience – yours and others' – and, wherever possible, testing things out before you make a decision.

This education space houses stools and mini-tables which can be set up to create one long rectangular table, or rearranged into small clusters of tables. (Extract from the Bolton Museum & Art Gallery case study)

There should be a parity of quality between the learning space and the rest of the site. Fittings, furniture and equipment should look good while being hard-wearing, compatible with different types of user, readily accessible, moveable and storable (where appropriate), easily and inexpensively maintained and replaceable, and all falling within your chosen or allocated budget. This can be a tall order if the needs of one type of user conflict with those of another.

This is the area of developing a learning space where compromises are most often made. The more you know about all the aspects of fitting-out and the materials and products involved, and the more detail you can include in the original brief, the more likely you are to get what you need. In addition, you will be better able to assess where a compromise can be made without jeopardising the effectiveness of the working environment.

The quality of furniture is high; less so the fittings. A compromise was made between the fittings and keeping within budget or using the money for other things. (Extract from the Techniquest case study)

The watchword is practicality. For example, decide what will work best in the circumstances of your space. Remember that you are equipping what will be a hard-working environment. Assess the need for robustness alongside that of high-quality design and materials, and what other essentials might be purchased for the cost of a top-quality product. Always consider the IKEA factor. Also bear in mind that in creating a flexible space, you do not want it to be anonymous; the space should impart a sense of place and give a sense of the identity of the site.

Consulting others and reaching decisions

'It is imperative that people liaise with the user groups and audiences they wish to attract. Museums cannot think they know what people want without asking them.' *Museum Educator, Anon*

However modest the project, consult with staff and the range of users to compile a list of what you need. For example, surveys of pupils reveal that their ideal space should include comfortable seating and tables at the right height for them. A learning space that caters for a wide range of age groups may have to opt for a one-height-fits-all approach for such furniture as tables and benches, for both sitting and standing work. Such decisions benefit from wide discussion and testing different heights with various users and those working with them. Such a process can lead to one of those acceptable compromises.



'It is imperative that people liaise with the user groups and audiences they wish to attract. Museums cannot think they know what people want without asking them.'

Museum Educator, Anon



'Make sure that you do plenty of research at other institutions. Ensure that you are involved in every stage of the design and fitting-out process.'

Education Officer, Big Pit, National Mining Museum of Wales, South Wales



'Make sure that you do plenty of research at other institutions. Ensure that you are involved in every stage of the design and fitting-out process.'
Education Officer, Big Pit, National Mining Museum of Wales, South Wales

When involved in a new build, work closely with the project manager, architects and contractors. It can sometimes be difficult to make sure you are part of a decision-making process that often becomes *ad hoc* and individual as contractor or architect marks out what they may consider their own professional territory. By the fitting-out stage, you should already have developed an effective working relationship with the architect, who should know by now that you are not going to go away and who should be impressed by your tenacity, attention to detail, and knowledge of the issues and products. None the less, always consider the architect's or contractor's advice and suggestions – and always ask for their advice when you are uncertain.

'The architect listened to us and mostly did what we wanted. We had to fight for a few things.'
Angela Roostan, Operations Manager, Techniquest, Cardiff

Be especially firm about getting the type of, and location for, sinks, power points, tables and chairs that are right for *your* needs. Blackout facilities are a priority, but are often overlooked; this is something that should be incorporated into the original design rather than left until the fitting-out stage. For example, one architect omitted the agreed plan for blackout when he decided that it spoil the architectural vision of the space as a whole.

Health & safety

Some decisions about fitting-out will be determined by health & safety regulations or concerns. When such concerns are raised, always discuss the issues involved and negotiate possible solutions, rather than be intimidated by them. Ensure that the concerns are valid, and look for solutions that do not jeopardise the effective running of the space.

Safety concerns required less than compatible fire doors. The stained glass of the Education Room doors had to be reinforced between two sheets of strong clear glass. But 'we did get very expensive non-reflective glass which would not break and did not compromise the colour of the stained glass.' (Extract from the Bagshaw Museum case study)

Sourcing

Be closely involved in the sourcing of fittings, furniture and equipment: find out for yourself what works, through research, consultation and experience. This is a major factor in achieving a successful learning space. The Horniman Museum devised a successful process by which education and facilities teams made decisions together. Often, however, the teams were asked to state their requirements but were not involved in the selection or purchasing process. This led to too-heavy sliding doors; cupboard shutters that are hard to operate, and catch fingers because of too little space between shelf edge and shutter; ropes for working blinds that children love to play with; and hi-tech soap dispensers that cannot cope with children's endless fascination with new things. In short, high quality should not lead to over-sophistication.

Consider your organisation's commitment to sustainable development. Are you committed, wherever possible, to sourcing locally produced resources made from sustainable sources, or to supporting local craftspeople?

Ensure also that you can source replacement parts easily and inexpensively. This is another reason for seeking local suppliers wherever possible – or, when your main users are children, for consulting those experienced in dealing with schools' needs.



'Look for simple, straightforward solutions when fitting-out heavily used areas, and always test things out first.'

Barbara Alcaraz, Deputy Facilities Manager, Horniman Museum, London



1,2,3,4 & 9
 The River & Rowing Museum
 5,7 & 8
 The Horniman Museum
 6
 The Lighthouse

Services

The services you use, where they are situated in the space, and the methods by which they are delivered, depend on the kind of site or institution you are, the location of the learning space, the range of activities you want to offer, and the number of visitors to be catered for. Health & safety regulations cover the installation of services generally and for learning spaces. However, there is more to consider than the basic rules.

One factor is to provide services in environmentally benign ways. This includes arrangements for energy, water and waste.

'We wanted, and got, a building that demonstrates best practice in terms of sustainability and enables people to see what that best practice is.'

John Rhymer, Director, Bishops Wood Environmental Centre, Worcestershire

The heritage status of a site, and the kind of artefacts on display or stored, also influences the type, use and location of services. Our case studies show that workable compromises can be reached between the need to protect buildings (particularly historic buildings) or displays, and the need to ensure that a learning space is properly equipped. For example, Bolton Museum & Art Gallery located its learning space within a gallery but installed stopcocks under the sinks to turn off the water and keep the cupboards locked when not in use. The Women's Library has a passively controlled environment system rather than air-conditioning, which as an additional benefit reduces heating costs as well as environmental damage by 80%.

General issues to consider include:

- Activities going on in the space
- Number of people involved in sessions
- Best locations for each service
- Convenience in relation to other fittings, furniture and equipment
- Health & safety

- Number and size of each service point, e.g. sinks, power points, lights
- Types of energy sources and methods of installation
- Potential to adjust, extend and relocate
- Cost and ease of maintenance

Consider also:

Water

- The need for hot and cold water
- Precautions to avoid flooding

Electricity

- The equipment needing electricity
- Where to locate power points, e.g. floor, worktop and/or ceiling level, and flexible points to be moved around the space

Lighting

- The balance between natural and artificial lighting
- The impact of natural light on the space, such as location, extent, dimensions and type of glazing, potential glare, and the need for blinds
- The type of lighting you need, such as ceiling lights, table lamps, directional lighting, and dimming options
- The need for effective blackout facilities

Sinks

According to our survey, two-thirds of respondents said that provision of sinks is poor or no more than adequate. This remains a serious problem, and one that could easily be avoided – if only architects, contractors and project teams acted on the stated requirements of those who run learning spaces. Always research the size, type and number of sinks you need, where to locate them and the heights at which you want them. Ensure that the plumbing system can cope with the disposal of the waste products your activities will create. Our case-study sites have identified that standard drain fittings are not robust enough to deal with paints, sand and similar materials; these need a wide-bore drain and filters.

Temperature control & ventilation

The temperature and ventilation of a learning space are determined by such factors as the number of external walls, extent and type of glazing, ceiling height, and the type and location of heating systems installed. A further consideration is whether the materials or equipment used for activities in the space produce dust, fumes or heat. This includes ICT equipment, which can increase the temperature in an enclosed space. Some sites, such as archives and museums, have special requirements because of the artefacts on display or in storage.

DFES regulations set out minimum requirements for temperature and ventilation control in schools, and these should be applied to learning spaces in other settings. For example, a classroom should maintain a minimum temperature of 18°C (64.4°F).

Location can be a significant factor. For example, underground spaces seem to be popular with some architects and directors but are often reported to feel oppressive, airless, and enervating.

Consider the following:

- The impact of both natural and artificial lighting on the space
- The heating system to be installed in the space, especially its efficiency and ease of control
- Activities requiring ventilation to control dust, heat or fumes
- The benefits of access to fresh air, and whether you want to be able to open windows
- Whether windows require blinds – both to cut out glare and to enable the use of TV/AV equipment

Toilets

The key issues about toilets are:

- Where they are sited. Can they be exclusively for those using the learning space, thereby addressing child protection issues?
- How they are fitted-out. Can they be wholly or partly designed and fitted-out specifically for children?

- How many to install. Will they be used regularly through the day or only for a short span of time? Will they cope with the short periods of heavy use, e.g. 40 children in the space of a 15-minute break?

Cost will determine some of the answers. Few sites say they can afford, in terms of cost and space, toilet facilities exclusively for children, although this was obviously a priority at Eureka! The Museum for Children in Halifax, which has frequently won 'Loo of the Year' awards. Some sites have them exclusively for everyone using the self-contained education centre. Bagshaw Museum has had to make the toilet facilities accessible to all Museum visitors, and has installed CCTV as a child protection measure.

Fittings can be a mix of adult and child level, or accessible to both – such as a single trough urinal for males, rather than individual stalls. The main concerns are that the facilities should be well designed, robust, readily accessible, easy and inexpensive to maintain, child-friendly and safe. There should always be accessible toilets for users with a physical disability.

Acoustics

What you can do in a space can be limited by the quality of sound-proofing and acoustics. Some sites build both into the design and fitting-out; others accept a certain level of sound leakage, organising sessions so that a noisy activity does not clash with a quiet one next door; and some enjoy the 'inevitable' hub-bub of a lively and successful learning space.

Sound quality is vital, so consider:

- Shape and size of the space, including ceiling height
- Materials used in construction or fitting-out, e.g. glass walls
- Furnishings and equipment in the space
- Number of people who work in the space
- Type and variety of activities they will do
- Intrusion of noise from elsewhere in the site or outside it

Always test the effectiveness of sound-proofing or acoustic fittings or design.



'We wanted, and got, a building that demonstrates best practice in terms of sustainability and enables people to see what that best practice is.'

John Rhymer, Director, Bishops Wood Environmental Centre, Worcestershire



Costs

The project's budget will determine the location and size of a learning space, as well as the type, extent and quality of the fittings, furniture and equipment. But always remember that, whether you have a large budget or no budget at all to speak of, your project is important and should be planned carefully and in detail.

Whatever the project, three costs are likely to be involved:

- Research and consultancy costs to establish the right space and fitting-out for your needs
- The cost of equipping the space, such as furniture, fittings and equipment
- The costs involved in running or maintaining the space

If building work is involved, add in the capital cost of building or renovating the space, including professional fees and some contingency funds, however small.

There is also the 'hidden' cost of staff time for those involved in the project, such as that spent on research, meetings, reading drawings and documents, and visiting other institutions and sites.

The financial cost of a learning space does not reflect the level of thought, commitment or innovation that goes into its development; its success at promoting learning and creativity; or its importance to the work of the site as a whole. For example, Dyrham Park's study centre cost just £360, which was spent on flexible storage units and lighting. That was sufficient to meet the specific needs of the education team and its programme, and the practicalities of the space available to be developed.

Whether a learning space costs half a million or just a few hundred pounds, the issues are the same:

- Clarify uncertainties or gaps in the budget for the learning space
- Involve someone in the team who understands costings and balance sheets
- Be prepared to negotiate for what you want, and renegotiate any unsatisfactory allocation of funds
- Establish a quality standard for materials used, and for the furniture, fittings and equipment to be bought
- Compare different materials, furniture, fittings and equipment before making a choice
- Estimate running costs for the space in terms of services, materials, and day-to-day maintenance

- Be realistic about what you can afford
- When necessary, assess the implications of a smaller space, a less favourable location, a lower level of fitting-out, or a reduction in the type of activities in the space – then decide where cuts might be made
- Devise a future timetable for buying what cannot be afforded in the initial fit-out

At times, you will have to compromise on costs. Reassess your needs and establish and negotiate for what is an acceptable compromise for your particular site and the activities you plan.

Building something new to match the high standards of the original stone building would be expensive. 'We ... needed to put something down on paper to get some idea of costs, and to start applying for grants.' (Extract from the Bagshaw Museum case study)

When the Horniman Museum staff had their budget cut by 20%, they opted for smaller spaces rather than lower quality. When Bolton Museum & Art Gallery learned that a reduced amount had been awarded for their project, the education team met to discuss priorities.

In deciding priorities – and to keep within budget – Techniquest Science Discovery Centre opted to focus more on the quality of furniture than on fittings. Director Colin Johnson explains: 'There was a cost within which the project had to be achieved. The overall standard of fittings, such as lights and doors, is not good. But the quality of the envelope and the ambience, style and feel are brilliant.'

Always ask three questions when deciding on costs:

- What is essential and cannot be compromised on?
- What can be set aside or abandoned without jeopardising your priorities or principles?
- What can be introduced or reinstated in the future?

'There was a cost within which the project had to be achieved. The overall standard of fittings, such as lights and doors, is not good. But the quality of the envelope and the ambience, style and feel are brilliant.'

Colin Johnson, Director, Techniquest Science Discovery Centre



- 1 & 3
The River & Rowing Museum
- 2
Bolton Museum & Art Gallery
- 4, 5 & 6
Techniquest Science Discovery Centre



Storage & Display

'We have odd-shaped equipment which does not fit easily into drawers and cupboards – even though our storage space was quite considerable.'
John Rhymmer, Director, Bishops Wood Environmental Centre, Worcestershire

Storage – and, to a lesser extent, display space – remains one of the most problematic areas in developing and running learning spaces. A common refrain is that 'there is never enough storage space'. The main issues to consider are the items and materials that need to be stored, the amount and type of storage required, and where to locate it around the learning space.

Storage may seem an unexciting aspect of planning a learning space, but the consequences of inadequate storage facilities can have a detrimental effect on the work of the education team. Spaces can quickly become overcrowded and untidy; some activities may be curtailed when materials or equipment are unavailable because they cannot be stored anywhere.

Significantly, our survey of museums and other sites found that over three-quarters of respondents are not satisfied with their storage space for works, resources and materials.

Order, neatness, clear worktops and accessibility are some of the essential ingredients of a successful storage policy. Some venues, like Bagshaw Museum, hide storage space behind cupboard doors or 'fat' walls. How, therefore, can you identify and acquire the kind of storage facilities that will make your space work well?

Establish your storage requirements

General considerations include:

- The type and frequency of the activities you offer
- The number and age range of the children, young people or adults involved
- Fire and health & safety regulations
- Your future needs (see *Planning for the Future*, p.14)

Consult with staff and users to help you answer five key questions:

1. What items do you need to store?
2. Which items are used regularly and which stored long-term?
3. How might this affect the location of storage?
4. What capacity should the various types of storage have for the size, shape and weight of equipment and materials you use?

5. How much secure or lockable storage do you need?

Check that you will have storage capability for:

- materials, tools and equipment (e.g. *interactives, paper, paint, pens, pencils, brushes, clay, fabric, glazes, plaster, stone, wood, OHPs, monitors, television, video*)
- reference material (e.g. *books, magazines, slides, CD-Roms, tapes, prints, models, and 'found' items for stimulus and still-life work*)
- the work being produced (e.g. *written/ art work, sketchbooks, models*)
- people's belongings (e.g. *bags, coats, lunch boxes, teachers' and gallery educators' personal items*)

Storage must be capable of holding 3D objects (stimulus or works created in the space). A plan chest is the best thing for larger paper sizes. Standard kitchen units are popular in learning spaces, but check that they are strong and deep enough, and meet your particular needs. Other items needed might be hooks and trays.

Here is a checklist of things to do:

- Calculate how much space you need, based on the answers to the above questions, and on the DfES guidance for schools (see *Location & Dimensions of the Space*, p.12)
- Establish the budget to be allocated for creating storage
- Draw a plan of where you need the different kinds of storage to be located
- Consider what should be the right height, depth, and materials used for the different kinds of storage
- Check the accessibility of proposed storage spaces for every kind of user
- Consider ways in which storage might be 'hidden' behind doors or inside 'fat' walls
- Check what equipment and materials need to be stored on open shelves for easy accessibility
- Make sure you can keep different kinds of items separate in storage, e.g. paper supplies and cleaning equipment
- Consider how and where to store valuable artefacts for handling sessions/study collections
- Identify ways to create flexibility and adaptability in storage



- Assess such practicalities as the need to move heavy items around, e.g. using storage trolleys for accessibility and versatility
- Consider issues of visibility: what should be on show and accessible to make it clear what goes on in the space

Ask other people about their storage successes and failures, and test storage options to check what works best for you. What looks a good buy may not work well. Consult staff and users, and include them in the testing process. Look through up-to-date supplier catalogues and ask other people to recommend national and local suppliers.

Cupboard shutters that are hard to operate, and catch fingers because of too little space between shelf edge and shutter. (Extract from the Horniman Museum case study)

Storage facilities need to be within or adjacent to the learning space, and readily accessible. One learning space has to store equipment under the education room: it takes two members of maintenance staff to move the equipment each time. Often, useful storage in the learning space has been taken over for other needs, such as housing cleaners' materials or even part of the museum's collections.

Having done the research on what you need, what is available and the likely costs involved, discuss all this with colleagues – and, in the case of a refurbishment or new build, with the project manager, the architect, and (where relevant) the contractor. A continuing dialogue while you are doing the research is even better. Negotiate the best storage you can for your space. Insist that storage should look good and match the quality of the rest of the learning space, and the venue as a whole. At the same time, keep in mind that 'quality' does not need always mean 'expensive'.

At this stage:

- Consider carefully any suggestions for change and improvements made by colleagues, users, project leader and architect
- With a refurbishment or new build, keep in mind that architects may have different criteria for judging the location and type of storage. They may not be aware of the nature and extent of your storage needs: so be very detailed in specifying your requirements, and always check what they are proposing to install
- Make sure that what you, or others, are proposing is compatible with the location of other elements of the space, e.g. sinks, power points, circulation, and opportunities for display

- Check that the storage plans do not conflict with creating a light, open and airy space in which to work
- Establish what you are prepared to compromise on, and what you are not
- Remember that storage problems increase when a space is used for activities other than learning. For example, you may have to 'hide' equipment and materials when using a space for a formal lecture or corporate event
- Be ready to make alterations if you find the layout or type of storage can be improved once in use, when priorities change, or when more people are involved in the learning activities

Display

At the far end of the Workshop is a glass-walled room used for meetings or quiet study. The walls of the room – which look on to the Workshop space and out to the central area of the Education Centre – are constructed as transparent, cube-shaped display cases for art work created on site. (Extract from the Lighthouse case study)

Dedicated areas for display purposes are important for any learning space, but from our survey seem to be frequently overlooked. Just one in five sites consider their display space to be 'good'. Use the following guidelines to assess your display needs and the potential of your learning space for display:

- Consider the type, size, amount and location of display equipment needed
- Identify the best location for the display of, for example, artefacts, project work, drawings, models
- Do not sacrifice working space for display space – both are essential
- Ensure that the materials being used for the walls and floors of the space suit your display purposes and the hanging systems you want
- Check that the type and extent of material used for display purposes will not be regarded as a fire or health & safety hazard
- Try different options for display, e.g. wall-mounting using garden trellis
- Find ways to make displays visible beyond the learning space
- Identify locations for display in other parts of the venue, and outside it



- | | |
|-----------------------------------|---|
| 1,2,3,5,7 & 8
Horniman Museum | 9,10 & 11
Bolton Museum &
Art Gallery |
| 6
The Lighthouse | 12
Bagshaw Museum |
| 4
The River & Rowing
Museum | 13
Ulster Folk &
Transport Museum |

Usage, Management & Maintenance

There is a clash between look and practicality. A combination of high levels of glass and a white finish makes it hard work to keep the building looking good. (Extract from the Techniquest case study)

A key factor in the success of a learning space is how well it can be used, managed and maintained. The space must be compatible with numerous physical and learning needs, and cope effectively with organising people of different ages engaged in diverse activities. It must be easy to keep clean and run efficiently, with repairs and replacements readily made. These matters can be determined by, and also help to determine, the location, dimensions and fitting-out of the space. They should be central in planning how to make better use of a space, and in any consultations with different user groups. Furthermore, they should be regularly assessed as the project progresses, especially when changes are being made to previously agreed plans.

Usage

Identify the different groups and individuals who will use the space – including staff. It may be that the site caters for specific ages because of the nature of its collections or archives; even so, try to build in some flexibility to enable the space to be accessible to and compatible with a wider range of user, in case the institution or its education team extends the reach of its work. Consider the following:

- Do the location and layout of the space suit different ages and physical abilities of all users?
- Are the fittings, furniture, equipment and materials used compatible with the range of users?

- Will all types of user be able to develop a familiarity with and feel 'ownership' of the space?

Management

Managing a learning space means managing the groups who visit the space, as well as the different types and levels of activity that take place there. To cope effectively with groups, you need to provide sufficient space for staff to meet and greet them; to be able to move them around without blockages; to ensure that there is a location for lunch; and to facilitate smooth exiting. Arrivals and departures are the times when toilet facilities are most heavily used.

- Assess the physical aspects of the space and site as a whole, such as corridors, stairs, toilet and cloakroom facilities, and refreshment areas in relation to the number and size of groups
- Ensure that there is adequate, prominent, and readable signage throughout the space and site as a whole
- Identify hidden areas that require extra monitoring or staffing to address child protection issues
- Fulfill the security requirements for the type and timing of activities
- Ensure that noisy events or spaces, such as a site's staffroom, are not scheduled or located adjacent to activities requiring quiet
- Allow sufficient turn-around time between events both to avoid congestion and to enable cleaning and other maintenance to be carried out

Cloakroom facilities and lunch areas

Cloakroom facilities and space for groups to have lunch are as much to do with management as with storage and fittings. Both remain a low priority with many senior managers and architects, and both cause many education teams considerable problems.

Our survey shows that two-thirds of sites have inadequate facilities for lunches. Secure provision (e.g. lockers) is rare, and our case studies show that cloakroom areas are often located along narrow corridors.

'[We] have a great team of attendant staff who help set up rooms, etc. Lack of lunch facilities and cloakroom space is crucial – it causes lots of problems and many lost bookings.' Education Officer, Portsmouth Museums

A key concern is that the learning space does not become a dumping ground for coats and lunches.

We have come across few examples of successful solutions to the lunch area/cloakroom dilemma apart from the large-scale and well-funded spaces in the British Museum and Natural History Museum (both in London), both of which work extremely well. That said, some smaller sites do resolve such issues satisfactorily. For example:

The nuts and bolts of a visit have become well organised. Staff meet the coaches and explain what will happen; coats and bags go into trolleys and are locked away safely. The reception area is open, airy and light. A decision was made not to put up pay barriers, to encourage the friendly atmosphere. Groups leave from a different exit so as not to clash with other groups arriving. (Extract from the Techniquest case study)

Maintenance

- Consult with the facilities team about ways and equipment to deliver an efficient and cost-effective cleaning and maintenance regime. This should not be an afterthought
- Install fittings, furniture, materials and equipment that are straightforward to maintain and renew. Furniture and equipment should, as far as possible, be easy to move and stack
- Consider the impact of inadequate storage on maintenance policy (see *Storage & Display*, p.20)
- Assess the costs of maintenance and monitor this once the space is in operation
- Ensure that there is sufficient staff available, and at key times, to clean and maintain the space regularly
- Avoid over-using the space to ensure that effective preparation for, and cleaning up after, sessions is not compromised

Floor coverings must be able to cope with heavy use and a range of activities, especially wet work. One venue reported problems with the linoleum 'rucking up'; others find it hard to maintain.

The floor covering is traditional lino which shows every mark; it has to be washed twice a day and treated with a coat of emulsion polish once a week ... in an education space, the floor covering should be vinyl with welded joints. (Extract from the River & Rowing Museum case study)

Bishops Wood Environmental Centre laid a linoleum floor made from sustainable sources of cork chips, linseed oil and jute. It wears well.

Mistakes are often made with the colour of the carpeting, with venues choosing pale or light colours; these are impractical in terms of cleaning, and readily show stains.



1 & 3
The Horniman Museum

2
Bishops Wood Environmental Centre

4
Bolton Museum & Art Gallery

'Make sure that you consider the maintenance aspects of the project. Don't let the designers give you long-term problems in this area. It may look good on day one ... but how easy will it be to maintain?'

Centre Manager, The Wildfowl & Wetlands Centre, Washington, Tyne & Wear

Adequate space for lunch is a chronic problem for most sites, particularly non-nationals, as is cloakroom provision. Whether lockers, hooks, cloakrooms, wheelie bins or crates are used, over half of sites regard such provision as poor.



Case Studies ...



@Bristol

Location

Harbourside, Bristol

Brief project description

The construction of a centre for science and technology, natural history and the environment, comprising attractions and facilities (Explore and Wildwalk) and including an IMAX cinema.

Cost of project

£97.3 million

Participants

Main funding partnership: Millennium Commission (£44.3m); South West of England Regional Development Agency (£17.1m); and Bristol City Council (£15.7m). Architects, Michael Hopkins & Partners (Wildwalk); Chris Wilkinson Architects (Explore).

Timescale for the project

@Bristol opened in July 2000. During 2001 and 2002 it won a series of architectural, environmental and tourism awards.

Space location

@Bristol is housed in a redeveloped dockside warehouse (Explore) and a new building (Wildwalk and IMAX). There is a dedicated education suite in each building.

Background to the project

@Bristol, an educational charity, is part of a £450 million urban rejuvenation scheme in the city's derelict Harbourside area.

The development process

The two education suites were conceived and designed when the project's main focus was on finalising exhibitions, and prior to the development of a clear education strategy. The education suites were situated away from the exhibition areas with education originally seen as a separate activity. Fitting-out of the suites was said to be 'at the end of the queue when the money started to run out'.

The outcome

@Bristol delivers an extensive programme of workshops, themed events and specialist resources supporting curriculum requirements for Primary and Secondary pupils and their teachers. There are also numerous family and other group events and outreach activities. Much of this programme is carried out in the two education suites and around the interactive and multi-media exhibition halls, including a TV studio and planetarium.

The flexible and creative use of spaces and a good understanding between the education and exhibition teams help to overcome the disadvantages of location and fitting-out of the suites – disadvantages created by there being little specialist educational programming input during development. Both education and exhibitions benefit from belonging to the same department, comprising education, project management, ICT and maintenance staff. In addition, the building is wired throughout, adding to the ability to adapt spaces for different activities.

Excellent chemistry and bio-chemistry labs are offset by the existence of a specialist food science lab that can no longer be justified. The two laboratories need upgrading in order to offer all the technical facilities for lab-based work across the science curriculum.

The Wildwalk education spaces are regarded as superficially elegant but impractical. The main building (or 'Explore') learning spaces are not finished to the same standard as the exhibition spaces; however, they are seen as 'serviceable'.

Specific problems for the centre include some poor acoustics, difficult access to toilets and storage facilities, and a noisy air-conditioning system. Ben Barker, Education & Programmes Manager, points to the fit-out not being wholly suited to young children, with desks and workbenches that are too high. But the overriding problem, adds Director of Learning Catherine Aldridge, is that the project was initially more 'architecture-led than looking at day-to-day practicalities'. For example, the Wildwalk foyer has such bad acoustics that two groups together create an unacceptable noise. The main access to the Wildwalk education suite is by a small lift, making it frequently unusable by groups.



Features:

- The need for input from education staff (at a high level) in the development process for a new site
- The need to consider ease of access for educational groups to dedicated education spaces and in terms of circulation around the site
- The need to consider the location and visibility of education spaces in relation to exhibition areas
- The need to consider education as a funding priority when developing a new building which includes education spaces
- The benefit of close working between education and exhibition staff



Indeed, some original design decisions seem to have ignored the fact that the education team would be handling large groups. The meet-and-greet system had to be relocated from the education suites to the main foyer, making a trolley store redundant. There are no dedicated lunch facilities. The TV studio, within the exhibition area, is a closed space that discourages visitor participation, and is being rethought.

Lessons learned

- Always ensure that there is educational involvement and expertise at the development stage, with a clear vision for the programming needs of the spaces
- Running a state-of-the-art science centre requires regular updating and refurbishment
- The visibility of learning spaces – or, in the case of @Bristol, integrating them within the exhibition spaces – is now a priority
- Ensure that there is a workable balance between space for front-of-house activities and space for workshops, storage and offices

Key factors

- An honesty about what is wrong, coupled with creative thinking and hard work to make the spaces work sufficiently well
- A joint approach to education and exhibition development
- A clear understanding about what needs to be changed in any future development
- A proactive approach to learners, in terms of the interactive outreach programme and seeing schools as crucial partners in developing future learning programmes and spaces, including 'virtual' learning spaces

'We know that science centres have pioneered valuable ways of motivating, making accessible, engaging, and conveying fundamental scientific concepts. The challenge for us is to be more proactive in getting schools to accept and absorb these new techniques.' *John Durant, Chief Executive, @Bristol*

The flexible and creative use of spaces and a good understanding between the education and exhibition teams help to overcome the disadvantages of location and fitting-out of the suites – disadvantages created by there being little specialist educational programming input during development.



Bagshaw Museum

Space title

The Education Room

Location

Batley, Kirklees, West Yorkshire

Brief project description

A dedicated, permanent Education Room with the facilities – including toilets – to enable the Museum to offer a wide variety of activities to schools and other educational users.

Cost of project

£225,000

Participants

Client, Brian Haigh for Kirklees Metropolitan Council; Architect, Paul Turner of Kirklees Estates, Properties & Markets. Funders, Heritage Lottery Fund (HLF) (£115,000); European Regional Development Unit (£90,000); Kirklees Metropolitan Council (£20,000); plus £85,000 for art works from Arts Council England.

Timescale for the project

Initial contact was made with the Council architects in 1994, and a Heritage Lottery Fund application submitted in March the following year. HLF approved the grant in September 1995 and work began in December; however, the first contractor went into liquidation and a new contractor recommenced the project in August 1996. The Museum was re-opened in November of the same year.

Background to the project

Bagshaw Museum is housed in a Victorian Gothic mansion in parkland overlooking Batley. Built in 1875 as a private house, it was purchased in 1909 by Batley Corporation and opened in 1911 as a museum containing varied collections including local and natural history.

The Museum houses displays which embrace local and natural history, Ancient Egypt, and objects from around the world. In 1986 Brian Haigh was appointed to run the Museum which, following local government reorganisation, had come under the control of Kirklees Metropolitan Council and was part of a group of museums and galleries. His priority was to develop the Museum's educational services. Despite lack of space and inadequate budgets, school usage of the Museum and its collection increased, placing great strains on the limited facilities available. An extension was needed to provide a dedicated Education Room and toilets; the emergence of Lottery funding made this more than a pipe dream.

The development process

The original building and the potential budget dictated the scope of the new space, which had to be located on the ground floor. It was out of the question to use existing rooms, because of their decorative interiors and because doing

so would reduce the Museum's display capacity; however, building something new to match the high standards of the original stone building would be expensive. 'We knew what we wanted and now needed to put something down on paper, get a better idea of costs and start applying for funding,' says Brian Haigh.

Haigh determined what he wanted by assessing how schools use the Museum, and by talking to teachers and artists. He also looked at art spaces in schools and education spaces in other museums, and drew on his own experience as a teacher taking school parties to museums and galleries. Although schools are the Museum's main users, it also works with local community groups; they too were consulted and the plans adapted to ensure that the space was flexible enough to meet the diverse needs.

The Museum worked with Paul Turner, a Council architect, and it was decided to build on the side of the Museum. Haigh gained approval from local councillors and officers for leisure & recreation and education: 'Their interest was that we provide better facilities, but they were also keen to know how we would pay for it and what the revenue implications might be.'

Turner had to address two challenges: to create a design that was sympathetic to the existing building, and which would partly be below ground level because of the slope of the land. Both Haigh and Turner wanted the building to reflect the Victorian architecture and materials but also to look contemporary.

Key considerations included the need for a lot of light coming into the building. The decision to reject a flat roof, avoiding water and security problems, and to go instead for a steep pitched roof mirroring the roofs of Walter Hanstock's original building, created the opportunity for skylights. It was also important for artists to work in the space, and a programme of art works was incorporated into the design.

Despite trying different layouts, neither curator nor architect could create the space they wanted on the restricted site. 'That was the main disappointment and we had to acknowledge what could be done on this particular site,' Haigh concludes. 'I knew what I wanted and stuck out for it. There are people who say, well you can manage without this – or, can we go for a cheaper option? I didn't want to cut corners. I wanted very good finishes.'



Features:

- The benefit of having a project champion with educational expertise
- The benefit of consulting teachers and other users
- The benefit of involving artists in the development process
- The challenge – in terms of design constraints and costs – of adding education space as an extension to a museum housed in a historic house
- The value of natural light in an education space
- The advantages of knowing what you want from the outset

The outcome

The Education Room is compact and airy. Light streams in, especially from skylights in the steeply pitched roof. Kathryn White, current curator, calls it 'a modern bright jewel that connects with the rest of the building'. She reports that 'children love that sense of space and light; it just doesn't look like a school classroom'.

The space measures 94m² and caters for 35 to 40 children doing a range of activities. Primary schools come from across northern England. Groups can be divided into two, with one working in the Museum and the other in the Education Room. The space's flexibility allows the Museum to programme conferences, corporate events, and evening and weekend talks, as well as school, community and holiday activities.

The extension is divided into two parts by a corridor, which provides access from the original building. A glass screen with coloured panels by Kate Baden Fuller separates the Education Room from the other facilities; the same stained glass architect was responsible for the huge sculpture that hangs in the roof space, and for the decoration of the terrazzo floor of the corridor.

Walk on around the corner and you reach the new toilets: the Museum now has a 'Loo of the Year Award' for their child-friendly facilities and unique tile decoration based on themes from the collections by a local artist.

Inside, storage and a sink take up the back wall, hidden behind cupboard doors. Tables and chairs are readily stackable. At the far end, a door leads into a small courtyard where children can work outside or have their lunch in warm weather. Again, art works (by Marlon Brandis and Andy Hazell) have been created around this area.

Carpet has not proved the most suitable floor covering, although children do like to sit on the floor as well as on chairs; it looks grubby from all the clay and paint which has been used in the room, and worn from the numbers of people passing through. Another problem has resulted from the temporary cessation of building work in early 1995 – due to the insolvency of the original contractor. As a result of water getting into the foundations at that time, salt periodically fluoresces from the plaster of one of the walls.

Safety concerns required less than compatible fire doors. The stained glass of the Education Room doors had to be reinforced between two sheets of strong clear glass, but (adds Haigh) 'we did get very expensive non-reflective glass which would not break and did not compromise the colour of the stained glass'. Haigh also won a battle over commonly used but 'unattractive' Georgian wired glass.

Lessons learned

Overall, the space works and does what is required of it. Rethinking small details would gain more space and storage remains a Museum-wide problem: 'A strong education programme requires a lot of storage.' Haigh would also like to have created a dedicated working space to plan and put exhibitions together. Mistakes should be 'put right immediately rather than storing up problems for the future'. He cites some faulty plumbing and wrongly cut stone lintels. 'It's all about quality. Whatever happens, stick to your guns. You can't change part-way through; it's too expensive. So stay focused.'

For architect Paul Turner, this was an exciting project and different from the more mundane work that local authorities must do. He stresses the importance of establishing close links with the client – 'make sure you know what they want and they understand that is what you are giving them'.

Key factors

This project highlights the importance of having someone with vision, drive and not a little cunning to 'run with' such an initiative. The client was clear about what was needed, and what experience he lacked he happily sought from others. His background in both education and museum work was vital, as was his ability to work within the local authority set-up, identifying the main people to persuade and influence. He gives credit to others in the local authority who backed him, and identifies a critical ingredient when he talks of someone's personality being as important as their experience in key posts. 'If someone sees the value of what you are doing, you are halfway there.'

'It's all about quality. Whatever happens, stick to your guns. You can't change part-way through; it's too expensive. So stay focused.'



Bishops Wood Environmental Centre

Location

Kidderminster, Worcestershire

Brief project description

To design a sustainable building in harmony with its environment, and causing minimal environmental damage, both in construction and in use. The building should use energy and water as efficiently as available technology permits, with materials having minimal environmental impact in manufacture.

Cost of project

£300,000

Participants

National Grid Transco, which owns the land, and Hereford & Worcester (now Worcestershire) County Council, which owns the Centre, each put up £100,000. The local Training & Enterprise Council (TEC) gave another £100,000. The architects were a county council team, comprising Iain Paul, Dave Millis, Duncan Bicknell and Isobel King.

Timescale for the project

Bishops Wood Centre opened in 1989. Three years later, in 1992, planning began for the new building; this was completed and opened in 1994. In 1995 it was runner-up as *Green Building of the Year*.

Space location

Bishops Wood covers 70 acres (28 hectares) of ancient and newly planted woodland, meadows and ponds. The site includes a straw-bale house powered by solar cells and wind generators, a reconstructed Saxon hall, and an environment-friendly 'Home for Life' building by artist and architect Roger Dean. He is designing an early-years environmental centre for the site.

Background to the project

In 1989, the Centre inhabited a single portakabin (later two). Its popularity meant that staff soon needed a permanent and larger building incorporating classrooms, toilets and office space – one which fulfilled their environmental principles, and accommodated their learning programmes for schools on sustainability, biodiversity and the natural world. The Centre also offers courses and seminars for education and environmental professionals; advises schools and business on environmental matters; and runs a forest school scheme for early-years children.

The development process

How do you design a successful indoor space with the aim of encouraging children to go outside? Director John Rhymer explains: 'Most of our learning takes place outside. This makes the indoor space even more important because children are there for a relatively short time at the start of their visit. So a building needs to do a special job of enthusing and motivating the children for what we are going to achieve during the day.'

The building had to create a visual excitement and anticipation in children and adults, sharpening their senses. It also had to link built and natural environments. 'When it came to briefing the architectural team,' says John Rhymer, 'we knew what we wanted from the building but not what it might look like. That was the architects' job.'

The building's circular design 'just evolved' as the most practical way to fulfil the design requirements, says architect Dave Millis. 'It was a hard battle with ourselves as we thrashed out the ideas we had for an organically designed building. It is really a simple building that came through a lot of hard work.'

The outcome

'We wanted, and got, a building that demonstrates best practice in terms of sustainability and enables people to see what that best practice is,' John Rhymer confirms. 'Many things are on the surface, and people can see what the building is made of.'

The timber building has solid tree trunks supporting the perimeter, with intermediate supports and beams of laminated wood. Paints and stains are organic. External walls use a breathable wall technology. Insulation is made from recycled telephone directories. Roofs are made of turf and cedar shingle, and insulated with rockwool and warmcell.

Inside is what Dave Millis calls 'an Aladdin's cave of the environment'. Children arrive at the meeting space (a gazebo), go to the cloakroom area, then into the large central space with floor and walls decorated with animal and plant patterns. Coloured footprints of different animals guide visiting classes to the various rooms. Throughout, children can open cupboards and discover exhibits for themselves. The building combines child-related and adult-related spaces and fittings, such as windows at different heights and every surface being touchable. Local schoolchildren made some of the door handles.

In the foyer, a central stairwell or tower, made from reclaimed bricks, both supports the building and acts as a thermal store. Vents in the roof and floor maintain an even temperature as the air circulates around the building. A foyer display incorporates electricity meters recording its different uses; energy use is monitored for efficiency, with lights going off and audio-stats turning the heating down when rooms are unoccupied. Water is conserved via a grey water system and reed bed sewage treatment. Chains hang from the building so children see where the water runs when it rains and understand the water cycle. In the toilets, large murals, painted by A-level students, explain the water cycle. Both paper towels and hot air dryers are available for hand drying and visitors are invited to make an informed choice. Paper towels are now composted on site.

Features:

- A sustainable space which uses its own structure as part of the learning process
- The challenge of seeing a building as a 3D teaching tool
- The challenge of designing indoor spaces which encourage visitors to engage with the outdoor space
- The benefit of architect involvement and enthusiasm
- The benefit of observing children and other visitors in action as part of the design process



'Ideas for the design came from seeing what [the children] do and how they move through and around a building; how they use their eyes and senses.'

In the Woodland room, children can explore shelves with natural objects and view, via close circuit video cameras, mice and voles feeding, and video footage of badgers and foxes visiting the previous night. The Woodpecker room has one-way glass to watch birds at nearby feeders and nest boxes. A weather station on the roof transmits information to an automatic display inside. The Solar room, housing the resource library, provides passive solar heating. The linoleum flooring is made from sustainable sources of cork chips, linseed oil and jute. The south-facing part of the roof has solar panels providing hot water.

The building nestles in woodland rather than in a clearing. Designing the outdoors was as important as the indoor spaces, explains forest school coordinator Jenny Doyle. Trees were cleared sufficient for the building, and trees will eventually grow through the boardwalk. The path from the car park meanders through the wood so you don't see the building until you are close.

A tight budget and some lack of skilled workers meant that some plans were abandoned, such as windows in the staircase tower. The work took 18 months rather than six: architects did a lot in their own time and staff, architects and their families did the cleaning up and planting.

Lessons learned

'When we first moved in we said we were 98% happy with the building. There was a lack of vents in the solar room because of the budget, and a dead-end in the cloakroom – children tend to get caught up there. It worked extremely well for a number of years, until we became victims of our own success.' There was pressure to increase numbers and a building meant for two classes now copes with three. The portakabins are still used.

The rooms were designed with children in mind but are not like classrooms, so they also work well for adults.

However, facilities are not specifically designed for early-years children. Problems are overcome by, for example, providing steps up to sinks and loos and regulating hot taps. For teacher Helen Ferguson, successful use of the building means a balancing act between adult and children's sessions. 'We would also like more toilets because of the greater number of children.'

The smaller classroom accommodates 60 young children, or 30 adults – but only 15 bag-laden A-level students. Demand for adult use has grown significantly, and this has led to a shortage of storage space. 'We have odd-shaped equipment which does not fit easily into drawers and cupboards – even though our storage space was quite considerable,' says Rhymer. Similarly, office space became inadequate quite early on. Some storage space is used for other things: for example, space for stackable chairs became the electricity cupboard because the fuse boxes were too big to be accommodated in their originally allocated space.

Dave Millis adds: 'Technically, we would have liked blinds which come into play as the sun moves around. We also wanted ducting that moved warm air around the building before being evacuated. But at the time, there was little expertise in innovative ventilation arrangements.'

Key factors

The most crucial aspect of this approach was that architect Dave Millis spent time observing the children. 'Ideas for the design came from seeing what they do and how they move through and around a building; how they use their eyes and senses.'

He continues: 'We had never been involved in a job like this before, and there was little information on how to do it. We started with a raw brief of the spaces needed. We began to see the building as a three-dimensional teaching tool, and how that relates to the Centre's work and the landscape. Talking to people helped us build a vision of what it should look like and how it should be built.' He also cites the Centre's infectious enthusiasm. 'If you have an enthusiastic client, the building reflects that. If you get clients who don't know what they want, you have problems.'

On ICT, John Rhymer argues: 'We don't want to stick children in front of computers here, but rather put them in touch with the real world.' However, computer and video technology can enable the team to extend the influence of a visit with advance preparation, web links to the Centre's activities, and downloadable materials for teachers and pupils.

Rhymer concludes: 'The adults who come here tend to comment on the spaces, exhibits and fittings. The children don't comment, their eyes just light up.' Perhaps the most revealing comment comes from architect Dave Millis: 'I come back regularly. I can't keep away.'



'The adults who come here tend to comment on the spaces, exhibits and fittings. The children don't comment, their eyes just light up.' Perhaps the most revealing comment comes from architect Dave Millis: 'I come back regularly. I can't keep away.'



Bolton Museum & Art Gallery

Project and Space title

Clore Activity Space

Location

Bolton Museum & Art Gallery is located in a 1930s purpose-built crescent in the centre of Bolton, Lancashire.

Brief project description

A flexible, multi-use education space located within the main Museum gallery.

Cost of project

Bolton Museum & Art Gallery could not afford to fund the space from existing budgets and so applied to the Clore Small Grants Programme for museum and gallery education, funded by the Clore Duffield Foundation. The Museum requested funding of £20,000, but due to fierce competition for limited funds received £12,150. The education space has been created using this reduced budget.

Participants

Dave Edwards is the Museum's Education & Access Manager supported by two part-time Education Access Officers, Tricia Harper and Miriam Moritz. Further support is provided by Liz Shaw, House Manager for Hall i' th' Wood Museum. Jon Finch, ex-Collections Services Manager (now Head of Policy & Development at North West Museums, Libraries and Archives Council), was involved in planning the education space and Ged Gaffey, the Borough's Building Services Manager, handled the fit-out.

Timescale for the project

Work on the education space started in October 2003 and was completed in December 2003. The space was officially opened in February half-term week 2004.

Space location & dimensions

The education space is, in fact, two spaces located at the rear of the first level of the general Museum gallery, on either side of a staircase and with a short open corridor linking one side to the other. The two spaces measure 86.52m² in total.

Summary of the project brief

A flexible education space located within the body of the Museum and providing easy access to the Museum's collections for learners of all ages. The space should be dedicated to educational activities and contain flexible seating and work tables, sinks and storage for resources.

Background to the project

Education is central to the work of the Museum, with a busy programme attracting 11,000 school and family visitors out of an overall annual visitor figure of 127,000 – although, as Dave Edwards explains, 'all previous education work has been done in galleries, with no facilities'. Bolton Museum & Art Gallery is funded by Bolton Metropolitan Borough and houses a collection comprising Fine Art, Egyptology, Natural History, Local and Industrial History and Ethnology.

The Museum building is home to an aquarium (in the basement), an extensive library and archive on the ground floor and the Museum & Art Gallery on the first floor. The basement also houses a purpose-built lecture theatre.

The three first-floor galleries display an impressive Egyptology collection, an art gallery (with changing exhibitions) and a general Museum gallery on two levels housing a wide range of artefacts including one of the key inventions of the industrial revolution, Samuel Crompton's 'Spinning Mule'.

The development process

Gillian Wolfe, Specialist Adviser to the Clore Duffield Foundation, visited the Museum in May 2003, as part of the assessment process for the Small Grants Programme. This meeting led to a review of options for the location and layout of the education space.

When the Museum learned that a reduced amount had been awarded for the project, the education team met to discuss priorities. It was decided that access to water and a floor to be messy on were the essentials, and that the space could do without a fitted screen to separate it from the rest of the gallery – the screen would have been an expensive addition because of the gallery's high ceilings and the location of the education space on either side of a staircase.

The outcome

The education space was created by removing four display cases and their contents. The area to the left of the stairs – when looking from the body of the gallery – has been fitted with two sinks at different heights and kitchen-style units with a linoleum splash-back. As the sink area is located within the body of the Museum, there was a concern about the danger of flooding and damage to artefacts. The simple solution – thought up by one of the education staff – has been to install a stopcock under each sink and a lock on the sink cupboard doors: the water is turned off and the cupboards are locked when the education space is not in use.

The education space houses stools and mini-tables which can be set up to create one long rectangular table, or rearranged into small clusters of tables. The area benefits from three full-length windows, although currently these are covered in UV film. The space can be used for slide shows – the team briefed 'dim-out' rather than 'blackout' – for formal education and for informal family sessions including handling sessions.

Features:

- An education space located within the main exhibition spaces
- The possibility of creating an effective, new learning space on a limited budget
- Finding that creating a dedicated education space can improve the morale of staff and raise the profile of education within an institution
- The benefit of a strong project team
- The need to focus on priorities and on achieving the possible



The space is home to one Apple Mac computer which is used for running slide shows or CDs. The education team's view is that, with limited resources, it is best to focus on what the Museum has to offer rather than trying to compete with schools in the provision of IT and ICT. As David Blair (a freelance educator) explains: 'When classes come here ... they're not here to look at a computer, they want to see the real thing.'

The area to the right of the stairs will house temporary displays, low-tech interactives such as a wooden Noah's Ark and a Lighthouse, along with informal seating.

The education space lacks the kind of storage needed for bulky art materials, stimulus materials and interactives. A useful cupboard under the stairs is currently used by the cleaners; a large museum store located behind the sink area of the space currently houses the Museum's insect collection. The aim is for the education team to take over the use of both spaces, but not in the immediate future.

There are ambitious plans to redevelop Bolton town centre, focused on the Museum and Le Mans Crescent of which it is part, but these involve potential PFI initiatives or substantial bids to the Heritage Lottery Fund. While plans are developing, the Bolton education team are pleased to have created a new, dedicated space on a limited budget – and a space that works well. As Dave Edwards says, 'We don't think of this as finished ... we have the floor, we have the sinks, the units, but apart from that it's developing and it will change.'

Morale has been boosted by the effective teamwork displayed during the project, and by the new-found visibility of education within the Museum. The team are pleased that they did not install a screen and feel that the open-plan space works well. A change in flooring from the gallery to the education space is the only discernible difference which helps to ensure a seamless sight line.

Lessons learned

- To create an education space, you may not need as much money as you think – but you *will* need to be clear about what you want, identify your priorities, and be realistic about what you can afford

- If you know a friendly architect, consult them – advice will not necessarily cost you
- An open-plan education space may mean that noise management is a potential problem, but it also brings benefits, notably the visibility of learning as an activity central to the working of the site
- Make storage a priority or you will struggle forever after. Storage in an art space needs to be capable of holding 3D objects (stimulus or works created in the space). A plan chest is the best thing for larger paper sizes
- Standard kitchen units will not be sufficiently deep for storing art paper, and the central support strut at the front of the cupboard will make it difficult to use the storage space effectively. Standard kitchen shelves will not be strong enough for heavy art materials
- Standard drain fittings will not be robust enough to deal with paints, sand and other art materials; you will need a wide-bore drain and a filter – in this instance, plumbers may not always know best

- Work out good wall display space to avoid problems with unstable display screens
- Focus on the possible – grand schemes are exciting, but they can prove distracting

Key factors

- Teamwork and commitment
- Working out priorities
- Clarity of vision and determination to create a new education space, however limited the budget



'We don't think of this as finished ... we have the floor, we have the sinks, the units, but apart from that it's developing and it will change.'



Dyrham Park

Space title

Learning Centre

Location

Dyrham Park, near Bath

Brief project description

An education base for activities focused on Dyrham Park, a 17th century historic house and gardens managed by the National Trust within the Trust's Wessex Region. Education provision takes place throughout Dyrham Park – in the house and grounds – and reaches a wide range of audiences, from Primary school pupils to Scout groups, family groups and garden enthusiasts of all ages including groups of young offenders.

Cost of project

Over the last four years, staff have spent time discussing options for developing the best kind of education space for the property. The Learning Centre was moved from an existing, smaller space one morning – in March 2003 – by six members of staff. A total of £360 was spent on flexible storage units and lighting from IKEA.

Participants

Dyrham Park is managed by Property Manager, Wendy Stott. Dale Dennehy is Garden & Park Manager. Susie Gay is part-time Education Co-ordinator, covering Dyrham and another local property, Lacock Abbey. Barbara Webber is Learning & Interpretation Officer at the Wessex Regional Office.

Timescale for the project

Four years to consider and develop the space; a morning's work to set it up.

Space location & dimensions

A suite of three rooms – a workshop (28m²), a meeting room (13m²) and a living-history space (19m²) – converted from an unused student flat located in the stable block of Dyrham Park.

Summary of the project brief

A flexible space providing a base for visiting schools and other educational groups; a safe space where students can make a noise, make a mess, leave bags and eat lunch.

Background to the project

Susie Gay was appointed four years ago as part-time Education Co-ordinator. When she arrived at Dyrham there was no desk for her to work at, and no dedicated space for education. Education took place on an *ad hoc* basis, with 'Arts in Trust' activities being housed in a temporary marquee.

Initially, discussion about the location of education activities at the property focused on the idea of using the Scullery, but there were problems: this space is located within the main house, raising issues of access, security and conservation. There was even a debate about what colour paint could be used on the walls. At this point, Susie decided that an alternative space would have to be found.

The need to provide access for groups of 45 to 60 educational visitors at a time – many of whom are school children – is a challenge for many National Trust properties, but particularly for a property like Dyrham where fragile tapestries and books, as well as delicate fittings, limit the number of 'light hours' in the house to 1,000 a year. Dyrham is one of only 13 properties cared for by the Trust with this level of restriction.

The development process

Dyrham Park is a late 17th century house with a Victorian kitchen and orangery. The history of the house does not fit very easily into the National Curriculum, in that it is a particularly complex period of history and tends to fall between key areas of study. Over time, and through a process of trial and error, Susie Gay has found that the property is well suited to work relating to the art and design curriculum, in that the quality of the interiors and of the craftsmanship involved in creating them provides inspiration for school children from Primary level through to GCSE and A-Level students: 'Working with children and getting them to understand about the history of the house ... actually looking at the architecture ... observing the way things are ... they do this much more successfully through art.' This focus on art and design activities required the development of a flexible space, close to the house and grounds, with access to water.

The arrival of Wendy Stott as Property Manager in 2001 led to a review of education provision. The property's first dedicated education space was in a room called High Chamber, in the stable block. This first space was not ideal, in that it was located at the top of a steep flight of steps and shared outside space with Dyrham's salvage area – the space reserved for rescuing valuable artefacts in case of a fire or other emergency at the property. However, the space was out of the main house and had access to its own toilet facilities. Most importantly, it provided Susie Gay with a base from which to start developing the property's education programme.

Any changes to the use of rooms within the house have to be approved by the Trust's curatorial staff, based at the property and in the regional office. To complicate matters, Dyrham receives a grant from the Historic Buildings & Monument Commission, which means that English Heritage also has to be consulted. Once the education centre was to be located in the stable block, concerns about conservation and access became less acute.



Features:

- The need to consider conservation and security issues in an historic house
- The need to take a 'whole site' approach to the delivery of a learning programme
- The possibility of developing effective learning provision through the creation of a learning space, using what is available as a starting place
- An education centre as a base for learning rather than the focus of learning activities
- The possibility – with determination and a willingness to improvise – of creating an effective learning space on a limited budget

In 2003, Wendy Stott and Susie Gay agreed to relocate the education space in an unused flat in another wing of the stable block. The flat provided more rooms and easier access, and the only person who needed to be consulted about the move was the Building's Surveyor who was able to confirm the load-bearing capacity of the floors.

The outcome

The Learning Centre was opened in March 2003. The Centre has a dedicated staircase – but no lift access – and its own bathroom. The main workshop space is converted from the flat's kitchen/dining area: the kitchen cupboards are used for storing art materials; the kitchen sink and draining area are used for washing up after art activities. The workshop space houses some art work created on site – currently a selection of colourful *papier mâché* bowls on display on the mantelpiece and a wood and metal chair created by one of the artists who regularly work with school groups.

As all of the Learning Centre is regularly used for meetings (in addition to learning activities), the kitchen area allows for the provision of on-site refreshments.

Natural light is plentiful in the workshop with a window into the stable block courtyard and, on the other side, into an internal garden area. The other two rooms have less natural light, with windows only into the courtyard. The living-history space is currently under development as a housemaid's bedroom; Susie Gay has been assembling a handling collection of furniture, fabrics and fashion from properties throughout the Trust.

Pupils at Key Stage 2 are the main educational visitors, although KS1 (House & Homes), KS3 (Glorious Revolution) and GCSE students undertaking course-work are also significant users. Young people with special needs are welcome, although students with limited mobility tend to use the Scullery or Orangery rather than the Learning Centre because of ease of access. Adult education is important to the property, particularly groups from the Workers' Education Association.

Lessons learned

It is important, in an historic house, to make the most of the setting. An education space is necessary, but as a base, not always as a place of learning in its own right – as Barbara Webber comments: 'The space becomes the base. It isn't the space for learning always, but is the base for the day.' Susie Gay notes that 'children ... remember a lot more about working in an historic house by working in the Scullery and the Orangery ... they get a special experience from doing that'. Working in a neutral space like the Learning Centre is 'a bit more like working at home'. Barbara Disney, an artist who works with children at Dyrham Park, confirms that using the historic spaces is 'a fantastic experience ... for the children and for me ... something completely other'.

Charman Flindell, a local Headteacher who has visited the property with her school, comments on the need for a variety of learning spaces: 'There isn't just one that's the way you'll learn ... I think that's the delight of coming to an old house or going to the beach ... they're both different and both very good experiences for children provided the right people are there working with them and actually bringing out the strengths of the place.'

Key factors

The approach to learning at Dyrham Park is flexible and improvisatory. As Barbara Webber explains, education spaces and education activities are tried out: 'Nothing is set in concrete ... it's all fluid and flexible depending on what the Trust's strategy is in terms of learning ... what the property wants to do.' Dale Dennehy notes that it is not a matter of choosing '... the ideal space'; but quite often the available space; of answering 'the need that arises at the time'.

The new Learning Centre is not seen as answering all the educational needs of the property. Dyrham Park currently receives more than 100,000 visitors of which approximately 1,600 are recorded as educational visits. The park and gardens have the capacity to take more visitors, but the house may be reaching its limit on visitor numbers; discussions are underway about converting a barn space in the Park as an alternative (and additional) base for outdoor educational activities.

Dale Dennehy notes that it is not a matter of choosing '... the ideal space, but quite often the available space'; of answering 'the need that arises at the time'.



The Horniman Museum

Space title

Education Centre

Location

London Road, Forest Hill, London

Brief project description

A new Education Centre as part of a larger redevelopment of the Museum.

Cost of project

Building costs of £13.5 million, of which the Education Centre cost £642,000.

Participants

Client, Horniman Museum; Architects, Allies and Morrison; Funders, Heritage Lottery Fund (HLF) plus a range of grant-giving organisations and individual donations.

Timescale for the project

In 1995 planning began for a new development, with the submission to HLF of a grant application in 1997. The original grant award of £17 million was cut by 20% and a new design approved. The 'new' Horniman opened in June 2002 and projected visitor figures of 250,000 were exceeded by 14% in the first year.

Space location & dimensions

The Education Centre forms part of the new development at the front of the Museum, and comprises 200 square metres. The Museum, in the Art Nouveau architectural style, is situated in 16.5 acres (6.6 hectares) of landscaped gardens on a hill overlooking London.

Background to the project

Frederick Horniman was a Victorian business leader, tea merchant, MP, and philanthropist. He was also a prodigious collector of cultural or ethnographic artefacts, natural history specimens, and musical instruments. In 1901 he commissioned a new museum from architect Charles Harrison Townsend to house his vast collection. He then donated both the museum and the collection 'to the people of London forever, as a free museum for their recreation, instruction and enjoyment'.

To celebrate the Museum's centenary, the trustees commissioned a new extension to expand and enhance the overcrowded galleries; provide new facilities such as a café and shop; and create a new Education Centre. The overall aims of, and requirements for, the Centre included the creation of:

- two multi-functional, self-contained education spaces (each about 68m²) for the full range of education activities such as wet work to object-handling sessions, plus presentations, workshops and seminars
- associated facilities such as toilets, lunch areas, cloakrooms, and storage
- a centre that would accommodate school and family groups, community and adult learning groups both within and outside Museum hours

- a bright, spacious, creative feel to the space

An adjacent Hands-on Base was also to be redesigned and upgraded.

The development process

The original brief was put together by the director and senior management team, comprising head of finance, assistant director for curatorial and public services, and head of collections management and special projects. The latter, Kirsten Walker, acted as project champion or leader through whom all consultations were channelled and became the key link with the architects.

The Museum's different teams, such as education, were asked to specify what they wanted in terms of spaces and what should be in them. Drawings and descriptions were circulated for comment and amendment at the two key stages of applying for planning permission and agreeing the detailed designs. The teams were also brought in to discuss specific aspects of the development that affected their future work. An internal team, plus an external consultant, handled access issues.

Two advantages of this approach were that the Museum was always on top of the budgetary implications of changes, and that there was one person able to maintain long-term oversight of the development process.

Kirsten Walker explains: 'One factor was that we started to design the project with one group of people and finished it with another. For example, the head of education changed halfway through and each wanted different things. So we were able to adapt to the changing needs.'

Finbarr Whooley, who runs curatorial and public services, adds: 'One difficulty was interpreting complex drawings. So we always tried to ensure that they were understood. Even so, people sometimes didn't take things seriously until they saw them in reality. That didn't really happen with the education team because they crawled all over the plans.'

Head of Education Carolyn Roberts explains her team's approach: 'We used a 3D model to test the logistics of the "get ins" and "get outs" of the number of groups visiting each day. This helped us plan the layout of furniture and understand the capacity of the spaces for different activities. 2D plans can be hard to follow and models can provide a more accessible and faster consultation format. Each team member acted as an advocate for the different audiences they served, and consulted informally with local contacts and networks in the community.'



Features:

- The value of a project leader, providing continuity in a long and complex building project
- The need for education staff to find a way of understanding, and engaging with, the plans for a new learning space
- Coping with a budget cut part-way through a project
- The value of education staff being involved in sourcing fittings and furniture for a learning space
- The importance of managing the realities of a finished space



This coherent framework for developing the new building also enabled the Museum to cope with having to reduce the budget by 20% because of the eventual size of the HLF grant. Space sizes were reduced or redesigned and a new aquarium was abandoned. But there were to be no cuts in quality. The overall result, according to the staff, is 'a better building' because they had to think harder about what they really wanted and had to be more creative in designing particular areas.

The outcome

Despite having to be scaled down, the Education Centre does what the Museum intended. The two rooms, with a set of sliding doors, have created 'a transformable space that works'. Just as vital, the Centre is self-contained within the Museum with an additional, separate access so that activities can be held outside Museum hours. Access from within the Museum is by a door with a coded lock to prevent unauthorised entry.

The whole Centre is enhanced by large windows down to the floor and, in one room, by skylights. One room is used for wet work; the other for 'dry' activities such as workshops, seminars and lectures. However, their success often relies on good management in order to overcome some less successful space and fittings decisions.

For example, the second room can only be accessed through the first as a corridor could not be accommodated in the final design. The sliding doors are very heavy because of the acoustic baffling, which in turn does not work as well as intended. So discussion sessions in one room cannot be scheduled at the same time as a school group's lunchtime in the other. All security staff are trained to work the heavy sliding doors.

The toilet facilities are exclusive to the Centre. They are fitted to a high quality and usable by all ages – although some fittings are not best suited to heavy use by children, and do need regular monitoring to keep equipment and cubicles working effectively. There are not enough toilets but the number was determined by the size of space available. For the same reason, the Centre's corridors tend to be too narrow but coat-hanging space is recessed. The general management and cleaning regime for the Centre is carefully organised to ensure a smooth operation, helped by the fact that Deputy Facilities Manager Barbara Alcaraz has an education background. The regime is hampered only by a lino floor that has a tendency to ruck up in places.

There is some making-do. For example, the 'green' building attached to the front of the Museum in the 1990s was to be a temporary interactive classroom and environment centre. The education team now uses part of it as offices because they have outgrown those in the Education Centre itself.

Lessons learned

The importance of sourcing fittings and furniture is one of the major lessons to come out of this Horniman development. The results tend to be more successful where the education and facilities teams made the decisions, rather than those with less direct experience. Often the teams were asked to state their requirements but were not involved in the selection or purchasing process. This has led to the heavy sliding doors; cupboard shutters that are hard to operate, and catch fingers because of too little space between shelf edge and shutter; ropes for working blinds that children love to play with; and hi-tech soap dispensers that cannot cope with children's endless fascination with new things. In short, high quality should not lead to over-sophistication.

'Look for simple, straightforward solutions when fitting-out heavily used areas,' recommends Barbara Alcaraz, 'and always test things out first.' A related issue is being able to source replacement parts both easily and inexpensively: this means seeking, wherever possible, local suppliers or those experienced in dealing with schools' needs. Head of Education Carolyn Roberts adds: 'We did source the tables, chairs and benches ourselves. They are light, foldable or stackable, easy to clean and replace. We looked at what schools use and went to educational suppliers, got samples and tested them out.'

Key factors

The critical success factors of the new development, and of the Education Centre in particular, include the detailed, collaborative and firmly led development process; the determination not to have the vision spoilt by a major budget reduction; and the emphasis on drawing on the direct experience and expertise of the users – both staff and school and community participants. Head of Development Marcus Pugh points out that it is a building that now works for all its diverse participants: 'The Horniman is very consultative, formally and informally, and that has led to a great resource.' He adds, 'It has become a bit like a village hall in the way the local community use it for activities.'

'We did source the tables, chairs and benches ourselves. They are light, foldable or stackable, easy to clean and replace. We looked at what schools use and went to educational suppliers, got samples and tested them out.'



The Lighthouse, Scotland's Centre for Architecture, Design and the City

Space title

The Education Workshop

Location

Glasgow, Scotland

Cost of project

Design and construction, £12 million; fittings & fixtures, £0.5 million

Participants

Client, Glasgow 1999 Festival Company; Architects, Page and Park (Glasgow); Interior Designers, Javier Mariscal (Barcelona) and Sam Booth (Glasgow); Funders, Glasgow City Council, Scottish Enterprise Glasgow, Heritage Lottery Fund, Historic Scotland, Scottish Arts Council, Strathclyde European Partnership.

Timescale for the project

The idea of building an architecture centre in Glasgow was first proposed in 1994, when Dr Stuart Macdonald (now Director of the Lighthouse) worked as Senior Adviser for Strathclyde City Council. The project was approved during the Glasgow Design Festival in 1996 and work began on the building in January 1998. The Lighthouse opened in July 1999.

Space location & dimensions

The Lighthouse is located in the centre of Glasgow, Scotland's largest city. The Education Workshop (250m²) is one of three dedicated learning spaces within the Education Centre (1,000m²) that occupies the whole of the second floor of the building; other spaces include the Young Designers' Gallery, an interactive gallery for children aged from three to eight (the Wee People's City), and an ICT centre.

Summary of the project brief

The requirements of the Education Workshop were clear from the start: an accessible, multi-functional, flexible and inspirational space for learners of all ages to engage with architecture and design as a creative process.

The space should incorporate facilities for hands-on learning, e-learning and reflective learning as well as a dedicated, creative learning space for small children. It should provide display spaces for the work created on site and well-designed storage for art and design resources and for visiting school parties. In summary, in the words of Stuart Macdonald, 'a learning environment designed, built and furnished to the same standards of quality as any other space in the building as a whole'.

Background to the project

Glasgow is the birthplace of architect and designer Charles Rennie Mackintosh who designed the building in which the Lighthouse is housed. The creation of the Lighthouse was central to Glasgow's reign as UK City of Architecture and Design in 1999 and to the city's continuing cultural regeneration since then. The Lighthouse is the only architecture centre in Scotland, and is the largest architecture centre in the UK.

The development process

The Education Centre was always seen as being central to the plans for the Lighthouse project, and teachers, educational bodies and educationalists were consulted in the early stages of the project's development.

The internal fit-out of the Education Centre was briefed by Stuart Macdonald, drawing on his own experience as an educator and adviser, and using the expertise of the wider team involved in planning Glasgow's tenure as the UK City of Architecture and Design.

The outcome

The Education Workshop is a large, rectangular room with high windows along one side of the room providing good natural light. It can accommodate groups of up to 60 school-aged students working on practical art-making activities, or be converted into a lecture space for 80 adults. A bench running along the whole length of the windows houses Apple Mac computers; glass storage units display art work and architectural models. An overhead power track and wall-mounted sockets ensure that computers and electrical equipment can be used flexibly in the space.



Features:

- A dedicated educational space central to the whole development of the building, both philosophically and physically
- The value of a site director with an educational background
- The value of purpose-built fittings and furniture
- The value of building display space into an education space, e.g. transparent display cases forming the walls of an internal room
- The benefit of close working between education and exhibition staff



The wall opposite the windows is fitted with full-length wooden cupboards used for storing tables, school bags, and art and design resources. The wood is solid and well finished. The sink area was made to order – by a firm specialising in fittings for prisons – constructed of industrial stainless steel and housing two sinks, one at ‘child height’ and the other for adults. There are large steel cupboards on either side of the sink and kitchen-style cupboards above.

At the far end of the Workshop is a glass-walled room used for meetings or quiet study. The walls of the room – which look onto the Workshop space and out onto the central areas of the Education Centre – are constructed as transparent cube-shaped display cases for art work created on site.

The education offices are easily accessible from the Workshop space, allowing for easy interaction between workshop participants and the education and technical support staff. The visibility of the space, and of the education staff within it, sends out a clear message about the accessibility and importance of education to the work of the Lighthouse as a whole.

In the four years since the Lighthouse opened, the Workshop space has worked well. Demand for computer-based work has increased well beyond the original plans, leading to the installation of Apple Macs in the Workshop and the purchase of a mobile computer trolley housing ten i-books, to supplement the facilities in the computer suite.

The Lighthouse receives more than 40,000 educational visitors per year, out of a total visitor figure of 150,000.

Lessons learned

- Learning has to be seen as integral to the purpose and layout of a building, and planned-in from the beginning of the design process
- Education spaces and staff must be visible to all visitors/users
- Education staff must work to foster a sense of ownership, so that users of the Centre respect the spaces, cleaning and tidying at the end of an activity

Key factors

- A director with a background in education
- A clear vision for the organisation, with education as part of the core mission
- An organisational commitment to education: at the Lighthouse, the education and exhibition staff together form a Lifelong Learning team and meet on a monthly basis to discuss plans and review priorities
- A management style which places education and exhibition/curatorial staff on an equal footing
- An exhibition space within the education space: at the Lighthouse, the Young Designers’ Gallery houses a range of exhibitions throughout the year
- A planning process that integrates the planning of exhibition programmes and education



‘... a learning environment designed, built and furnished to the same standards of quality as any other space in the building as a whole ...’



The River & Rowing Museum

Space title

Education Centre

Location

Henley-on-Thames, Oxfordshire

Brief project description

The Museum was planned in two phases of development and included a multi-function education space. However, as the project developed, a second building was added to the plans and a purpose-built education room was included. Both phases were completed in time for the opening in 1998. After five years, there is now a need to increase the space available for education use and '... to improve on the quality of everything that education do'.

Cost of project

The total cost of building the River & Rowing Museum up to opening in 1998 was in the region of £10 million. The planned cost of the redevelopment of the Education Centre will be in excess of £500,000.

Participants

Design and construction of the Museum as a whole was mainly funded by the Arbib Foundation, while funding to set up the education service came from the Esmée Fairbairn Foundation. The Museum was designed by David Chipperfield Architects.

The redevelopment of the Education Centre has been designed by a local firm, Blackwood Architects, working closely with David Chipperfield Architects. Funding for the redevelopment is being sought from the Heritage Lottery Fund.

Timescale for the project

The development of the Museum as an institution and a building took about ten years, with contracts being signed in the early 1990s and construction completed by August 1998.

In 2003, the Museum held a fundraising ball to raise the match funding required for redeveloping the Education Centre; planning permission was obtained and the application to the HLF was submitted in December 2003. If funding is allocated, the work is planned to start in autumn 2004.

Space location & dimensions

The Education Centre forms the ground-floor level of one wing of the main Museum complex. Currently it comprises one dedicated education space plus a separate foyer containing coat-hanging space for visitors' belongings, and male and female toilets. The existing teaching space measures 72m². The new Education Centre will measure 450m², with enlarged teaching space (216m² in total).

Summary of the project brief

The Museum's plan is to convert the storeroom located adjacent to the current education studio into a second dedicated education space; and to develop a large, informal learning-space 'foyer' incorporating toilets, cloakroom and lunch area with refreshment bar. The new Centre will also allow for improved storage, education offices, and preparation space.

The foyer will be created by building an extension on to the front of the Education Centre, over the existing terrace. This will avoid the expense of ground works – the whole building is located on the flood plain and rests on stilts.

Background to the project

The Museum's education programme has proved highly successful, attracting approximately 8,000 educational users in 2003 – out of an overall figure of 60,000 visitors to the Museum. The education programme is led by a full-time head of education, with an education administrator and assistant, and delivered by a team of six freelance museum tutors who liaise directly with teachers in developing and testing courses. There are a total of 21 curriculum-related courses covering a wide range of subjects and age groups – attendance is charged at £2.95 per head including VAT (2003 prices), with overhead costs subsidised by the Museum. Details of the education programme are published in an annual course prospectus. The Museum also offers a variety of less formal courses for adult learners, children and family events, and adult specialist lectures.

The development process

The River & Rowing Museum is a successful and award-winning building. As Paul Mains, Chief Executive, explains, any problems with the present education space developed from the original brief: 'The architect's brief here was largely about the galleries and the public spaces. Yes, there was an Education Centre, but the architect wasn't particularly focused on that and his experience wasn't in that area. If we learn anything from this ... we didn't perhaps have a strong enough team facing up to the architect and the architect therefore took more responsibility ... it's an inspiring space, but the devil is always in the detail and sometimes that requires a much more collaborative approach.'

The plans for redevelopment of the Centre have been created through a collaborative process involving the Museum staff, Paul Swart as a specialist in school building, and David Chipperfield as a concept architect. All parties have been keen to maintain the integrity of the original building.

Paul Swart, the architect for the redevelopment, confirms the need to pay real attention to the process: 'I think you can't underestimate the focus you have to put on getting a building into position. In doing that, all else gets excluded unless you set up a separate team to do the next phase or to look at how the Education Centre will work. You can't help the fact that everyone is drawn into that construction spiral.'



The outcome

The existing Education Centre is an attractive and useable space, but does have flaws:

- It can be cold, and natural light is limited to one large glass window at the far end of the room and high-level windows along one side
- The original fitted furniture matched the rest of the building, but proved to be less than practical for its function: the cupboard doors were heavy and the height of the surfaces was not suitable for adult or child users. The Museum team solved these problems themselves, replacing the cupboard doors and creating pull-down worktops to cover the sinks, all with the help of a friendly local builder. The result is an improvement, but there are still some difficulties – the sinks have to be aired to prevent mildew, and the pull-down worktops are rather heavy
- The floor covering is traditional lino which shows every mark: it has to be washed twice a day and treated with a coat of emulsion polish once a week. Paul Swart points out that, in an education space, the floor covering should be vinyl with welded joints
- There is a lack of storage space, particularly for large-scale interactives, e.g. those used to demonstrate river processes. These items are currently stored underneath the education room and moved around, as required, by two maintenance staff. The storage space restricts the use of clay and plaster as do the sinks, in terms of the disposal of materials

- Access to the Internet is limited by the structure of the building which has exposed concrete ceilings and no grids or holes for cables. Chris Adams, the Museum's Property Manager, was previously facilities manager in a large Secondary school and knows from experience the need to over-specify in terms of cabling by 400%; this rule will be employed in the foyer space of the redeveloped Education Centre

Lessons learned

The major lessons learned for the River & Rowing Museum are the need for:

1. An education manager to oversee an education project
2. A project team to oversee the new developments
3. An architect with real understanding of education processes and spaces

Paul Swart has observed lessons in practice at the River & Rowing Museum, to see how children move around and to see the space in use. As an architect, he thinks that experience in educational settings is vital: 'You need to have been through a few temporary classrooms and a few Primary school extensions to learn the nitty gritty ... there's not a lot of architecture in some of these things and you don't want to have it, in a way; you want to suit the children first.'

Chris Adams, Property Manager, points out that a useable, versatile space is one of the most difficult spaces to design because 'something is always at the expense of something else'. He goes on to emphasise the importance of the architect's approach and experience: 'The architect in this area needs to be the sort of architect who will come in, spend time, listen, look, listen again, go back, come back and keep working until you come to the point where everybody is confident in it [the brief] – not just the architect and ... not just the client.'

Key factors

Emily Leach started work at the Museum as a curator, having worked for the Oxfordshire Museum Service in both educational and curatorial roles. When the River & Rowing Museum opened, she became Head of Education and has managed the education programme ever since; her breadth of experience is invaluable to the Museum.

The River & Rowing Museum team enjoy healthy debates about what they are doing and why. In the redeveloped Education Centre, storage space will be separated from preparation space, and will be designed to facilitate organisation and order. **The team would like to have a dedicated education technician whose job it is to maintain equipment and to ensure that items are labelled and always stored in the right place.**

They have discussed the use of new technology and conclude that, while Internet access is desirable, it is also important for a museum to offer something 'other' in terms of an educational experience. As Emily Leach says, 'I've tended to take the line that it is handling objects that's important because you can do that here and you can't do it in the classroom.' Paul Mains agrees: 'The point is that they're coming to the Museum for a different experience.'

Paul Mains further points out that it is vital to be realistic about what you can offer and how often facilities will be used. A lecture theatre may sound like a necessity, but if it's only used twice a month, it's a waste of space. He adds that the River & Rowing Museum is fortunate in that it has dedicated spaces for corporate hire and an in-house maintenance team who look after all the day-to-day running of the spaces in the Museum, including the Education Centre. It also has in-house IT expertise and plans to develop its use of new technologies, with flat screens and audio-visual displays in the galleries and other areas of the Museum.

Features:

- The need to plan for the future, creating a building that can accommodate changes, e.g. cabling for new technology
- The challenge of coping with success
- The importance of a strong project team
- The need for input from education staff (at a high level) in the development process for a new site
- The value of an architect who spends time understanding education and the use of education spaces



Techniquest Science Discovery Centre

Location

Stuart Street, Cardiff

Brief project description

To design and build the first purpose-built science discovery centre in Britain.

Cost of project

Total £6 million, of which the build cost £3.7 million and fit-out £2.3 million.

Participants

Clients, Cardiff Bay Development Corporation with Techniquest; Architects, Ahrends Burton & Koralek (ABK), London; Funders, Welsh Office (European Regional Development Fund), Wales Tourist Board and Welsh Development Agency.

Timescale for the project

Techniquest first opened in temporary premises in 1986. In 1988 it moved to the Cardiff Bay area and began planning for a new building. Seven years later Techniquest opened in new premises redeveloped from a 19th century engineering works in the old docks area.

Space location & dimensions

Cardiff Bay is a regeneration area. Techniquest covers an area of 3,000m², half of which is permanent exhibition space on two levels, and has more than 160 exhibits exploring scientific phenomena.

Background to the project

Techniquest's mission is to develop people's understanding and appreciation of science. It is aimed at schools, other educational groups and leisure visitors, and operates an outreach programme.

As well as an Exhibition Hall on two floors, the site comprises a 100-seat Science Theatre, a 30-seat Planetarium, a multi-purpose Lab for workshops and continuing professional development courses for teachers, a Hub with Internet facilities, and a Discovery Room with curiosity boxes for school children aged from seven to 11, and families.

Techniquest's programmes cater for two different audiences: schools in school hours, and families and the public at other times. Themed programmes for schools from early years to post-16 offer demonstrations in the Theatre and Planetarium, exhibition visits, written material for teachers and pupils, and Laboratory and Discovery Room sessions.

Techniquest designs and makes its exhibits in its on-site workshops. A trading company, Techniquest Enterprises Limited, offers consultancy services and sells or rents out exhibits and exhibitions.

The development process

Cardiff Bay Development Corporation, a fixed-term urban regeneration organisation, raised the funding and commissioned the architects. However, explains Techniquest Director Colin Johnson: 'Realising they did not have the operational experience of such a centre, the Corporation told the architects that while they were the client in one sense, the functioning client was Techniquest. We had a series of meetings and brought in people to refine our mission and sat down with the architects and looked at the details and how to match the needs with the budget available.'

By redeveloping a 100-year old building, the architects were required to build around an existing envelope.

Techniquest's project manager liaised with Cardiff Bay, whose own project manager liaised with the contractors. A Cardiff-based architect was the 'interface' between Techniquest and his main London office. For example, he drew up the office space and, with Techniquest, specified the furniture.

The outcome

The building is well laid-out and adaptable to changing needs. Both architect and client regard it as 'a model for co-operation'.

Operations Manager Angela Roostan says: 'The architect listened to us and mostly did what we wanted. We had to fight for a few things. For example, we wanted a lunch area but didn't get it; we did get a cloakroom, which is now used as the lunch area. We wanted to retain as much of the education and exhibition areas as possible. But we realised that to attract schools, we needed somewhere for them to put their coats and eat their lunch, otherwise they wouldn't come.'

The quality of furniture is high; less so the fittings. A compromise was made between the fittings and keeping within budget or using the money for other things. Colin Johnson acknowledges: 'There was a cost within which the project had to be achieved. The overall standard of fittings, such as lights and doors, is not good. But the quality of the envelope and the ambience, style and feel are brilliant.'

The Lab is regarded as the least thought-out of the spaces in terms of facilities – for example, it has no hot water. This was because there was little idea of what the Lab should be used for. This is seen as 'a classic example' of requirements changing as projects develop. The Lab was originally earmarked for in-house development work rather than for public use.



Features:

- The need for careful, detailed thought at the start of a development process
- The need to build adaptable buildings that can evolve with the changing needs of the users
- The importance of facilities such as lunch areas and cloakrooms in supporting the uses of a dedicated learning space
- The reality of budget compromises and the need to know priorities
- The importance of managing a space well, e.g. cleaning



There is a clash between the look and practicality. A combination of high levels of glass and a white finish makes it hard work to keep the building looking good.

A pale carpet in the exhibition area was soon changed for a more practical colour.

It is too early to assess the long-term maintenance costs of the building, but currently they do not differ from the projections. The Centre closes for three days a year for a comprehensive maintenance and cleaning overhaul.

New projects and activities have put the building more under pressure, especially in terms of office space. Two portakabins have been erected behind the building as a partial and temporary solution.

Lessons learned

The building has evolved, rather than been radically altered, in response to changing needs. Its location means that additions can only be made upwards rather than to the sides. Staff say they could do with two more wings to the building.

Pressure on space means that priorities are drawn up for the use of any vacated space. For example, Education Director Dr Anita Shaw comments: 'Given the way that science communication is going, it would be wonderful to have breakout rooms for debates with post-16 students. There is no space for that now.'

She also cites the need for another lab, and extra exhibition space to bring in temporary exhibitions. The Planetarium doubles as a story dome, meaning that the large projector must be moved in and out. The main inconveniences remain inadequate office and storage space.

Science teacher Sue Woodberry comments: 'The only problem is that the labs are not big enough for teachers and students. They can be cramped for practical work.' Primary Deputy Head Yvonne Scott notes how her pupils 'like the talks but also love the treat of playing on the floor of the exhibition area'. There is some pressure from regular school visitors for more frequently changing or increasing exhibits, but every new space or development has staffing and revenue implications.

Two key lessons have been learned. The more enclosed spaces there are, the more staff you need. Minor 'opening-up' modifications have been made to allow better use of the educational spaces.

Noisy spaces, such as the staffroom, should be located away from quiet spaces, such as conference rooms.

The nuts and bolts of a visit have become well organised. Staff meet the coaches and explain what will happen; coats and bags go into trolleys and are locked away safely. The reception area is open, airy and light. A decision was made not to put up pay barriers, to encourage the friendly atmosphere. Groups leave from a different exit so as not to clash with other groups arriving. However, arrivals can still cause short-term blockages in reception. There are no problems with the toilets.

One initial concern, says Colin Johnson, was lost children. 'However, the architect seems to have designed the building so you don't get lost within it. You quickly get a sense of how it works. This means that signage is not crucial.' In addition, staff are always in attendance in unsighted areas.

Key factors

Spaces need good organisation, combined with sufficient, knowledgeable and collaborative education and floor staff to make them work well. Staff are encouraged to 'think about their first time here and to appreciate that that is how many of the visitors will feel'.

Demonstrations and workshops are well staffed. Anita Shaw explains: 'There are always at least two people in the Lab who combine a science background with good presentation skills.'

Spaces have been created which do not look or feel like a classroom but in which educational or pedagogic activities can take place. With on-site workshops, where the exhibits are designed and developed, staff can see how exhibits work and adapt them accordingly. Seemingly mundane things are treated with great importance, such as the value of high-quality cleaning.

Changes in ICT since the building was planned and constructed ten years ago mean that the building has become increasingly less constraining in this respect; Technquest is moving to wireless operations, with upgrading in the Science Theatre and the Lab.

The continuing adaptability of the building is due to the design and layout of spaces being carefully thought about at the start. Technquest did not want a 'signature building', but rather one that worked and did what they wanted it to. 'This is a modest little building compared to other centres since built,' says Colin Johnson. It was a wise decision.

'The architect listened to us and mostly did what we wanted. We had to fight for a few things. For example, we wanted a lunch area but didn't get it; we did get a cloakroom, which is now used as the lunch area. We wanted to retain as much of the education and exhibition areas as possible. But we realised that to attract schools, we needed somewhere for them to put their coats and eat their lunch, otherwise they wouldn't come.'



Ulster Folk & Transport Museum

Space title

The Education Room in Cultra Manor, the Ulster Folk & Transport Museum's Education Centre

Location

The Ulster Folk & Transport Museum is a national museum established in 1958 and funded by the National Museums & Galleries of Northern Ireland. The Museum is located in County Down, close to the centre of Belfast; it is home to a wide range of exhibit buildings forming a town and a rural area occupying 140 acres (56.6 hectares) of open countryside. Extensive transport galleries cover a further 35 acres (14 hectares).

Space location & dimensions

The Education Room measures 60m² and accommodates a maximum of 20 students taking part in art and craft activities. Groups are usually split into two, with one group using the tables and the other working at the looms or with other equipment.

Background to the project

Learning for all ages is central to the activities of the Museum. Primary schools are a major audience, but so too are adult learners – from City & Guild students studying textiles, to members of Northern Ireland's thriving Textile Guilds who come to study and use traditional craft skills.

Educational activities take place throughout Cultra Manor and at various locations in the Museum as a whole: in the Transport Museum, in the Folk Galleries and in the many exhibit buildings in the open-air museum. Primary school children re-enact Victorian court cases as part of their History Northern Ireland Curriculum studies in a recreated Courthouse in the town; this successful project was initially funded through the Clore Small Grants Programme. Also in the town is a residential centre used predominantly by school groups; the centre has living, sleeping and eating accommodation for 76, but no dedicated learning space.

The Museum attracts 180,000 visitors of which between 30,000 and 40,000 are educational. At peak times, the Museum can receive 8,000 visitors in a day.

In the early days of the Museum, Cultra Manor was used for offices, archives and libraries. Jonathan Bell, Head of Curatorial Services, explains that in the 1980s the Museum benefited from the political situation in Northern Ireland in the sense that money was given to 'bolster anything that held Northern Ireland together in any way'. This resulted in a big expansion of the Museum including the building of new administrative offices and an archive in a separate building.

The development process

The Education Room was created within Cultra Manor in the early 1980s, to replace a prefab classroom in the grounds (which is still used as a lunch area) and in response to growing demand from school groups – many visiting the Museum as part of the 'Education for Mutual Understanding' initiative. As Jonathan Bell explains, the education space was created from the Museum's reference library stacks: 'It was never really fitted-out ... it was multi-functional, left over from what was here before ... it obviously isn't ideal.'

The outcome

'Children love coming into the big house ... it's full of mystery ... having all the trees around ...' *Members of the Focus Group*

The education space has wood-effect walls, rather like a chalet or tree house, and large windows looking out onto parkland. Although the windows are large, they are low – as is the ceiling – and the result is a dark room, especially in the summer when the trees are in full leaf. The original library lighting is still in place, but has been updated recently with an energy-saving system which means that the lights go out if there is insufficient movement in the room – fine when the room is in use by young children, but not so good when older learners are working on sedentary activities.

The Education Room is located above the Manor's kitchen which can make the room hot and smelling of food. The room for education staff – located next to the kitchen – is 'like a cupboard' and has no storage.

The education team have first claim on the Education Room, but share this and the other spaces within Cultra Manor with corporate events and catering. No resources or work are displayed in the space for the main reason that the room cannot be locked up; it is used at weekends for catering which can add to the difficulties, since education staff and learners often have to clean tables before starting work.

The Education Room is used mostly for practical craft activities and makes use of the sink in the kitchen next door. Although there are plenty of power points, some do not work, which causes problems with craft activities that involve sewing machines or other electrical equipment. The poor artificial lighting is a problem for close work; sometimes, adult learners bring their own desk lights. Storage is a real problem in that there are no built-in cupboards and, of the cupboards that are available, one is reserved for the Textile Guilds who use the space almost every weekend. The room is also used for Adult Courses at weekends.



Features:

- The challenge of managing learning spaces which are also used for other purposes, e.g. catering
- The importance of a learning space as a place that users can 'own', where they can reflect on what they have seen and heard, and where they engage in practical activities
- The challenge of making the best of spaces which are not purpose-built
- The challenge of embracing new technologies
- The challenge of creating an active educational programme, rather than a programme which reacts to demand



Pieces of equipment, such as looms, are left out, but everything else is stowed wherever possible. It can be difficult for visiting tutors to manage the space; they have to find a member of the education staff for the cupboard keys, and locating the equipment they need for a class can be 'tricky' – as can the cleaning.

The education team feel strongly that, despite the inadequacies of the space, it is vital to have an Education Room for which students can feel a sense of ownership. It allows learners to reflect on the contents of the Museum, to concentrate on activities and to use technical equipment such as looms. The education space is a place where learning is taken seriously, a centre of excellence where learners can be taught to a high standard.

For such a large museum, providing dedicated space for education is a real problem. The catchment area for the Museum is vast and demand is already heavy: in fact, the Museum's educational activities are often booked up a whole year in advance. There is great potential in post-Primary education, but booking so far in advance is difficult, as is taking children out of school for the day.

The staff feel strongly that the learning capacity of the Museum is restricted by the spaces they have. Given the Museum's outstanding craft- and other collections, they would like to be able to work more with Further and Higher Education students. As Alison Campbell, the Museum's Head of Public Services, explains: 'It's the physical constraints that are going to make the difference between us being a really good education provider and being an excellent one.'

The education staff would very much like to be able to provide computers and Internet access, but this is an area where facilities in the Museum as a whole are severely limited – the education team has a joint email address and Internet access from only one computer. There is a slide projector and an overhead projector, but finding them can be a challenge, as can finding the pile of books needed to prop them up!

Lessons learned

The staff at the Museum are very clear about what they need and want:

- A purpose-built education centre located near the Museum's town area
- A 'meet and greet' area
- Access for all kinds of users including students with disabilities
- A multi-functional and flexible space with:
 - Storage space for study collections
 - Storage for materials and equipment
 - Sinks and 'rolling furniture'
 - A cloakroom
 - A lunch area
 - Dedicated education toilets for children
 - Dedicated toilets for visitors with disabilities
 - Wet areas
 - Dedicated display space for resources, stimulus materials and work
 - Furniture for education use only, including separate dry and wet work tables
 - Computers with access to the Internet and to the Museum's collections

- IT support
- Controlled lighting
- Controlled heating
- A lecture room

- Internal transport around the Museum

Key factors

'What we're doing is so diverse ... we do need to cater for smaller groups and larger groups and performing arts and traditional craft workshops and lectures.' *Alison Campbell*

The Ulster Folk & Transport Museum has the collections, the policies, the physical space, and the staff commitment and enthusiasm to offer much more to educational visitors of all kinds. Valerie Wilson, the Museum's textile curator, sees her job as 'making aspects of the collection more accessible to support the crafts programme, education workshops and exhibitions'. She sums up the situation well: 'We don't need to actually do more here; we just need to do what we're doing with maybe better resources to make best use of the creativity and the expertise in the staff and external tutors that we have.'

Arlene Bell, Head of Education, adds that the Museum needs to consult more, to evaluate the education programme and try to find ways of doing more: 'It's the learners as well as the teachers we should be asking.'



The education team feel strongly that, despite the inadequacies of the space, it is vital to have an Education Room for which students can feel a sense of ownership. It allows learners to reflect on the contents of the Museum, to concentrate on activities and to use technical equipment such as looms. The education space is a place where learning is taken seriously, a centre of excellence where learners can be taught to a high standard.

The Women's Library, London Metropolitan University

Location

Old Castle Street, Whitechapel, London

Brief project description

To create a new building for the Library and its collections, comprising space for a reading room, archives, exhibitions, education facilities, and seminars.

Cost of project

£6.9 million including a Heritage Lottery Fund grant of £4.2 million. The London borough of Tower Hamlets donated the land.

Participants

Client, London Guildhall University (now London Metropolitan University); Architects, Wright & Wright; Funders, Heritage Lottery Fund and other donors including Bridgehouse Estates, the Clore Duffield Foundation, HEFCE, and the London Development Agency.

The education staff comprise a part-time access & interpretation manager and part-time assistant. Because of the nature of the collections, the majority of education groups are of Secondary school age or adults, with a minority of Primary-age groups.

Timescale for the project

In 1995 Maureen Castens, then the University's Head of Academic Services, and Deian Hopkin, Vice Provost, started planning a new building for the Fawcett Library and archives; Wright & Wright Architects were appointed. Two years later an application was made to the Heritage Lottery Fund, which awarded a grant in 1988. Antonia Byatt was appointed the first director of the Women's Library in 2000 and the new building opened in February 2002.

Space location & dimensions

Situated in Whitechapel on the site of a Victorian wash house and laundry, the Library occupies 2,000 square metres. The Activities Room is 30m²; the Clore Mezzanine is a multi-function space on top of the Clore Seminar Room, both of which measure 70m².

Background to the project

The Women's Library – formerly the Fawcett Library and its archives – holds the UK's most extensive collections of women's history, comprising books and pamphlets, journals and magazines, personal papers, records of societies and associations, plus photographs, posters, banners, and other visual materials. However, in 1995 the Fawcett, owned and run by the (then) London Guildhall University, was inadequately housed in a cramped basement with limited access and prone to flooding.

This project started as one woman's idea for a new home, and a new role, for the Fawcett Library. Maureen Castens explains: 'The University had this very valuable collection in a very unsatisfactory environment. But it wasn't something that just belonged to the University. It was part of the national heritage, and should be in a building to which everyone could come – not just academics.'

The idea was to create a building that combined library, museum and cultural centre, containing a reading room, archives, exhibition hall, education spaces, conference facilities and a café. It would also be a resource for Tower Hamlets' local communities.

The development process

Architects Wright & Wright were appointed early, with the detailed brief still to be agreed. This squared with the architects' principle of putting time and money into getting the brief right. The client/architect relationship thereby became a more organic process, and paid dividends: for example, architect Clare Wright realised the importance of the Library being on a separate site rather than located within an existing University building.

Client and architect believed that the new building should make a positive and sensitive contribution to its urban surroundings and to local regeneration; provide secure and environmentally appropriate storage for the collections; and be physically accessible and as sustainable as possible. They also agreed that education had to be central to the Library – a significant statement of intent given the paucity of dedicated education spaces in libraries and archives.

A University briefing committee comprised mainly librarians; there was no direct educational, archival, curatorial or development input until later. Clare Wright therefore took responsibility for researching and establishing educational space requirements, visiting other sites such as the Dulwich Picture Gallery and the Geffrye Museum. She explains: 'I was the only one on the team with children and so knew about school visits and the impact of 30 children at a venue and their need for lunch space.'

At first the University did not fully appreciate the project's potential and the building's 'footprint' was reduced. Eventually, however, there was a commitment to the need for 'a high-quality, high-prestige space'.

Staff appointed before the building's completion, such as Director Antonia Byatt, brought a more specialist and hard-nosed approach to thinking about location and flexibility of spaces. For example, exhibition space was added to the reception area to encourage in passers-by. A space-eating, ground-floor shop was deemed too risky and abandoned. Staff meeting rooms were changed into office space to cope with the proposed increase in staff. The architects' design ensured flexibility in opening and closing-off different parts of the building to reduce the need for security staffing for events.

The outcome

The finished building delivers all the spaces required over five floors, with education and exhibition spaces on the ground and mezzanine floors; café and toilets on the first; reading room on the second; and offices and archives sharing the next two floors. The basement houses more archives, plus toilets, cloakroom and lockers. The structure is a reinforced concrete frame clad inside and out with brick and set behind the façade of the original Victorian wash house. Other materials used are stone, oak, steel and glass. To meet strict environmental standards for archives, the building is passively controlled rather than air-conditioned: this reduces heating costs and environmental damage by 80% compared to conventional buildings – a first for the City of London and an HLF exemplar.

Features:

- The importance of seeing learning and access as central to the role of a library and archive
- The challenge of combining group activity and individual research in one building
- The value of an architect who understands the need for educational provision and is prepared to research best practice
- The value of a strong client/architect relationship
- The challenge of a limited site
- The limits of flexibility and multi-use



The most important lesson is that organisations change, both in terms of the activities they engage in and of how they want to operate once a building is in use.



There are three education spaces. The Activities Room behind the ground-floor reception area and the Clore Seminar Room in the exhibition hall cater largely for teacher and student sessions. The open-plan Clore Mezzanine area above the exhibition hall is used for a variety of educational activities, especially for younger children – the floor was laid so that children can sit or lie on it to work. This area also has full audio-visual links. Café and toilets are adjacent. All three spaces are used for handling sessions. There is a large sink in the Activities Room, which also has 'teaching walls' and projection facilities and leads on to an external courtyard, which visitors can use. However, wet work is also done in the mezzanine space because the education team realised they could use the sink and running water in an adjacent disability toilet.

Activities do have to be carefully scheduled to ensure that quiet sessions are not disrupted by noisy ones nearby. Nevertheless, says Access & Interpretation Manager Jo Green, the education spaces within and above the exhibition hall enable participants to move easily between their own work and reference material.

A more serious problem is the 'flawed logic' in the original plan of assuming that the education spaces need only cater for half a class at a time. In addition, no space was made available for group work in the Library itself. This logic has merely created logistical difficulties. The lack of a specified lunch area is less problematic, because only a small number of Primary-age groups visit the Library.

The difficulties of an enclosed seminar room located within the exhibition hall are highlighted when exhibitions are on – such as cramped areas for viewing and noise problems. Clare Wright explains: 'The ethos of the organisation changed. The original idea was for a home for a special library collection, with a fixed idea about exhibitions of valuable artefacts.' This meant, for example, that the exhibition hall had to have steel-lined doors for security, and unpainted brick walls so that dust would settle on the brick rather than on the objects on display. Exhibition cases are set into exposed brick walls, which are not intended for hanging exhibits except via an inflexible hanging system. This has had to be ignored, and curatorial staff drill into the walls when setting up exhibitions.

Given the restricted site, it was vital that the internal spaces 'were made to work hard'. Thus, many rooms were not labelled for an exclusive use but seen as multi-activity spaces. For example, chairs in the seminar room are lightweight and stackable on trolleys so the room can be used for other activities. The mezzanine level also has adaptable furniture to cater for teaching sessions or dining events, as well as children's workshops.

The requirement to build on a smaller site than was originally intended also led to some inevitable compromises. For example, the locker room is in the basement and the reading room on the third floor, in order not to reduce reading-room space. The same problem of not quite enough room means occasional blockages on stairs and at corners as groups move around.

Lessons learned

There was always what Maureen Castens calls, 'the difficulty of the bleak honesty of the specification' – in effect, how to negotiate for the right building within the context of a limited, and limiting, site. This was both a design exercise and a political one. 'Maybe we should have been tougher or more overt, because there are some things we might have done differently.'

The building reflects two inevitable tensions when education work and archives are brought together. One is between quiet research and vibrant group activity, which can be largely resolved by careful planning. The other, between accessibility and security, is seen as 'irresolvable', with some of the Library's new participants finding the physical requirements of security 'strict' or 'daunting' and the manifestation of some of the security doors unwelcoming.

Some space has not been used as fully as envisaged – partly because some of the technology plans were lost by agreeing an inadequate budget, and partly because there is some conflict between the intention for flexibility and the reality of designing a space. For example the café was designed with a dual use in mind, and has a white unadorned wall at one end which could work as a lecture and presentation space, but there are no blackout facilities and the service bar is static.

Further, the Library has learnt that flexibility and multi-use can have a limit or 'break-point' relating to the complex organisation required and the occasional internal confusion and conflict about what a space is actually for.

The most important lesson is that organisations change, both in terms of the activities they engage in and of how they want to operate once a building is in use. The challenge faced by both client and architect, says Clare Wright, was to address: 'What happens when a great deal of money is given to a very small organisation to create a quite different sort of organisation ... The Library was changed from being in a basement with ten readers and no education or development programme to what it is today. How best can an organisation plan for that?'

Part of the answer lies in building flexibility into the spaces. In educational terms it also means, for example, clarifying the age ranges to be catered for and the activities to be offered. Given the smallness of the site the architect had to work with, the building is surprisingly adaptable – except for the inflexibility of the exhibition hall. The Library staff are more ambitious than the building design allows for, and they now run programmes in a building not wholly adaptable for their purposes.

Key factors

The project was driven by the close understanding that existed between its originators, Castens and Hopkin, and Wright & Wright. This collaboration enabled both client and architects to address – if not always to resolve – the contradictions, tensions and complexities of an ever-changing brief, which continues to develop even after the building is complete.

'I was the only one on the team with children and so knew about school visits and the impact of 30 children at a venue and their need for lunch space.'



Where to Find Out More & Suppliers

Partner websites

Arts Council England
www.artscouncil.org.uk

Arts Council of Northern Ireland
www.artscouncil-ni.org

Scottish Arts Council
www.scottisharts.org.uk

The Clore Duffield Foundation
www.cloreduffield.org.uk

Artworks
www.art-works.org.uk

Commission for Architecture & the Built Environment
www.cabe.org.uk

Design Commission for Wales
www.dcfw.org

Department for Culture, Media & Sport
www.culture.gov.uk

Department for Education & Skills
www.dfes.gov.uk

The Heritage Lottery Fund
www.hlf.org.uk

The Museums, Libraries and Archives Council
www.mla.gov.uk

Publications

This is not a definitive bibliography, but rather a list of publications which have been of particular use in the research process, together with those specifically referred to in the report text:

Area Guidelines for Schools

Non-statutory guidance on overall area required for school buildings and school grounds, including area ranges for individual teaching spaces, in Primary and Secondary schools, and broader guidelines on non-teaching areas. Currently being revised in the light of changes addressed by *Schools for the Future: Building Bulletin 82* (revised July 2002, available on the DfES website: www.dfes.gov.uk)

Art Accommodation in Secondary Schools: a design guide Building Bulletin 89, DfEE (The Stationery Office, 1998; The Stationery Office; Tel: 0870 600 5522; Email: customer.services@tso.co.uk)

The Big Sink

Investigation into the ideal spaces for creative, and specifically visual arts, explorations in schools, galleries and museums (Clore Duffield Foundation, 2002; available on the Artworks website: www.art-works.org.uk)

Building Education: the role of the physical environment in enhancing teaching and research

(Helen Clark, Institute of Education, University of London, 2002; ISBN 0854736522, £8.95)

Building Projects: your role in achieving quality and value

(Commission for Architecture & the Built Environment and the Heritage Lottery Fund: www.cabe.org.uk)

Creating Excellent Buildings: A Guide for Clients

(Commission for Architecture & the Built Environment, 2003; www.cabe.org.uk)

The DCMS Core Principles Action Plan

Based on the recommendations of the *Learning to Listen* report (DCMS/Children and Young People's Unit, June 2003; available on the DCMS Children and Young People's Unit website: www.culture.gov.uk)

The Disability Portfolio

Collection of 12 guides on how best to meet the needs of disabled people as users and staff in museums, archives and libraries. Gives advice, information and guidance to help overcome barriers and follow good practice (MLA, 2003; www.mla.gov.uk)

Inspiring Learning for All

A web-based resource – www.inspiringlearningforall.gov.uk – enabling museums, libraries and archives to review and develop learning activities based on a framework of best practice and to measure their impact on learners (MLA, 2004)

Joinedupdesignforschools

Project that links UK designers with schools to show how design and creativity can improve the quality of life and learning in schools (see also *Design for Learning*). Run by the Sorrell Foundation. Details of the scheme are available on the website www.joinedupdesignforschools.com

Kit for Purpose: design to deliver creative learning

Explores how to redesign learning tools and resources, and procurement systems to raise attainment and better support curriculum delivery (Design Council, 2002; www.designcouncil.org.uk)

Participation – Spice it up!

A practical resource book to encourage participative working with young people (Save the Children, 2002; ISBN 1841870625. Available from Dynamix Ltd. at £18.95 plus p+p. Email: info@dynamix.ltd.uk; website: www.seriousfun.demon.co.uk)

The School I'd Like: Children and Young People's Reflections on an Education for the 21st Century (Catherine Burke & Ian Grosvenor, Routledge Falmer, 2003; ISBN 0415301157)

The School Works Toolkit

Practical 'how to' guide on the School Works participatory process, with contacts and mechanisms for obtaining design advice (School Works, 2002; www.school-works.org)

Understanding Plans: A layperson's guide to architectural drawings

Explains architectural drawings to make them more understandable and involve more people in the process of creating good architecture (available from Wordsearch, 5 Old Street, London EC1V 9HL; £2.00 inc. p+p. Tel: 020 7549 5400)

Working Knowledge: education spaces

Special issue of the Museums Association journal *Museum Practice* (Issue 23, August 2003, pp. 45–61; available from MA, 24 Calvin Street, London E1 6NW. Tel: 020 7426 6920)

Suppliers

Throughout our research for *Space for Learning* we have endeavoured to collect information on favoured products for learning spaces. We wanted to know which work well and which do not. As with our previous research for *Space for Art*, the findings have not been as comprehensive as we would have wished; but here are all the recommendations that we have received from sites to help inform your product-hunting:

The Consortium (*educational suppliers*)
Tel: 0845 330 7780; website: www.theconsortium.co.uk

Dalsouple Rubber Flooring
Tel: 01278 727777; website: www.dalsouple.com

Eibe Play Ltd.
Tel: 01483 813834; website: www.eibe.co.uk

Forbo Nairn Ltd. (*flooring*)
Tel: 01592 643 777; website: www.forbo-flooring.co.uk

GLS (*educational suppliers*)
Tel: 020 8805 8333; website: www.glsed.co.uk

Gopak Furniture
Tel: 01303 265751; website: www.gopak.co.uk

Hope Education (*educational suppliers*)
Tel: 0845 120 2224; website: www.hope-education.co.uk

IKEA
Website: www.ikea.com

NES Arnold (*educational suppliers*)
Website: www.nesarnold.co.uk

Sico Europe Ltd. (*mobile, folding equipment for educational establishments*)
Tel: 01233 643311 (or Freephone UK 0800 085 8186); website: www.sico-europe.com

Galleries and art education spaces

If you are particularly concerned with art-making and art exploration spaces, guidance is at hand in the form of the companion volume to the *Space for Learning* handbook.

Space for Art: a handbook for creative learning environments

provides practical guidance for best practice in the design, construction, resourcing and management of art-making and art exploration spaces in galleries, museums and schools. *Space for Art* is an Artworks publication for the Clore Duffield Foundation, 2003; available on the Artworks website: www.art-works.org.uk/research

To purchase copies of the report, please send a cheque for £5.00 (including p+p) to: *Space for Art*, Artworks, PO Box 105, Rochester, Kent, ME2 4BE

Keyword Index

- @Bristol, p.5, 15, **24-25**, 48, 49
- Access/Accessibility, p.5, 10, 12, 13, 14, 21, 24, 32, 33, 34, 35, 44, 45
- Acoustics, p.6, 18, 24, 35
- Activities, p.**8-9**, 11, 13, 14, 18, 20, 27, 41, 42, 44-45
- Architects, p.2, 3, 5, 6, 10, **11**, 13, 14, 17, 18, 21, 22, 28-29, 34, 38-39, 40-41, 44-45
- Artists, p.26-27
- Attingham Trust, p.6
- Bagshaw Museum**, p.5, 17, 18, 19, 20, **26-27**, 49
- Bishops Wood Environmental Centre**, p.5, 10, 11, 13, 15, 18, 20, 22, **28-29**, 49
- Blackout, p.6, 17, 18, 45
- Blinds (See Light/ing)
- Bolton Museum & Art Gallery**, p.5, 10, 15, 16, 18, 19, **30-31**, 49
- Brief, p.10, 11, 12, 14, 15, 16
- Budget (See Costs)
- Child protection, p.18, 22
- Circulation, p.13, 21, 24-25
- Cloakrooms, p.5, 22, 40-41
- Collaboration, p.6, 10, 11, 24, 36-37, 38
- Communication, p.6, 10, 11
- Conservation, p.10, 12, 32-33
- Consultation, p.5, 6, 10, 11, 16, 17, 22, 26-27, 34, 43
- Contractors, p.6, 10, 17, 18, 21
- Costs, p.4, 10, 13, 15, 16, **19**, 26, 30-31, 32-33, 34-35, 40-41
- Culture Online*, p.14
- Curriculum, p.6, 8, 9, 32, 38, 42, 46
- Design, p.10, 12, 13, 14, 15, 16, 17, 26
- Development process, p.6, 8, **10**, 34-35, 40-41
- Dimensions, p.5, 10, 11, **12-13**, 16, 22
- Disability, p.5, 18, 43, 45, 46
- Display, p.11, 13, **20-21**, 36-37, 43, 45
- Dyrham Park**, p.5, 19, **32-33**, 49
- e-learning, p.15, 36
- Electricity, p.18, 28
- English Heritage, p.32, 49
- Environmental sustainability, p.5, 17, 18, 28-29, 44
- Equipment, p.6, 8, 10, 13, 14, 15, **16-17**, 18, 19, 20, 21, 22, 43
- Fittings, p.10, **16-17**, 18, 19, 22, 34-35, 36-37, 40
- Flexibility/flexible, p.4, 8, 12, 13, 14, 15, 16, 20, 22, 27, 30, 33, 36, 43, 44-45
- Floor covering, p.6, 16, 22, 27, 39
- Furniture, p.6, 13, 14, **16-17**, 18, 19, 22, 34-35, 36-37, 39, 40, 43
- Future, planning for, p.**14**, 38-39
- Health & safety, p.17, 18, 20, 21
- The Horniman Museum**, p.5, 10, 11, 17, 19, 21, **34-35**, 48, 49
- ICT (See Technology, new)
- Inspiring Learning for All*, p.4, 6, 14
- Internet access, p.6, 15, 39, 43
- Learners, p.2, 3, 4, 14, 15, 37, 43
- Learning, definition of, p.4
- Learning styles, p.8, 14
- Lifelong learning (See Learners)
- Light/ing, p.6, 12, 13, 15, 16, 18, 19, 21, 26-27, 29, 33, 36, 39, 42, 43
- The Lighthouse, Scotland's Centre for Architecture, Design and the City**, p.5, 12-13, 15, 16, 21, **36-37**, 48, 49
- Listed buildings, p.6, 10, 12
- Location, p.5, 8, 10, 11, **12-13**, 18, 19, 22, 24
- Lunch area(s), p.5, 12, 13, 22, 25, 34, 38, 40-41, 42, 43, 44, 45
- Maintenance, p.19, **22**
- Management, p.**22**, 35, 37, 40-41
- National Trust, p.32-33, 48
- National museum(s), p.5, 6
- Non-national museum(s), p.5, 6, 15
- Partners, p.2, 3, 5, 49
- Power points, p.6, 16, 17, 18, 21, 42, 43
- Principles, p.3, 4, 6, 19
- Project champion, p.10, 11, 26-27, 34-35
- Project team, p.10, 12, 18, 30-31, 34-35, 38-39
- Quality, p.3, 14, 16-17, 19, 21, 27, 35, 36, 37, 38, 40, 44
- The River & Rowing Museum**, p.5, 10, 11, 13, 14, 15, 22, **38-39**, 49
- Security, p.15, 20, 22, 26, 27, 32, 35, 44-45
- Services, p.14, **18**
- Signage, p.22, 41
- Sinks, p.5, 16, 17, 18, 21, 30-31, 33, 37, 39, 43, 45
- Size (See Dimensions)
- Sound-proofing, p.6, 18
- Sourcing, p.17
- Space for Art*, p.3, 5, 13, 46
- Storage, p.5, 6, 13, **20-21**, 22, 24, 27, 29, 30-31, 34, 36, 38, 39, 42, 43
- Suppliers, p.17, 21, 35, 46
- Sustainability (see Environmental sustainability)
- Technique Science Discovery Centre**, p.5, 11, 12, 14, 15, 16, 17, 19, 22, **40-41**, 49
- Technology, new, p.6, 8, **15**, 18, 29, 31, 39, 40-41, 42-43
- Temperature control, p.6, 18, 28, 43
- Toilets, p.5, 12, 13, 18, 22, 24, 26, 27, 28, 29, 34-35, 38, 41, 43, 44-45
- Ulster Folk & Transport Museum**, p.5, 15, **42-43**, 49
- Usage (See Users)
- Users, p.6, 10, 13, 14, 15, 16, 22, 26, 38, 42
- Ventilation, p.18, 29
- Visibility, p.5, 12, 21, 24, 25, 31, 37
- Water, p.6, 10, 14, 18, 26, 28, 29, 30, 40, 45
- Women's Library, London Metropolitan University**, p.5, 11, 13, 14, 18, **44-45**, 48, 49

Favourite Spaces

In our questionnaires and case-study meetings, we asked for suggestions of learning spaces which people considered particularly successful or inspirational. The spaces could be in any kind of cultural site in the UK and beyond. In some cases, respondents specifically mention the learning spaces; in other cases, it is the sites as a whole or their websites that provide the inspiration. The responses were many and various; sites in bold were mentioned more than once:

@Bristol

Baltic, Newcastle
Brancaster Millennium Activity Centre, Norfolk (National Trust)
Bristol Zoo Gardens, Bristol
Bronx Zoo, New York, USA
Castlefield Gallery, Manchester
Centre for Alternative Technology, Powys
Chertsey Museum, Chertsey
The Children's Museum of Indianapolis, USA
Denver Art Museum, Denver, USA
Discover, Stratford, London
Discovery@Brooklands, Weybridge, Surrey
Dulwich Picture Gallery, London
Eden Project, St Austell, Cornwall
Eureka! The Museum for Children, Halifax
The Egypt Centre, University of Wales, Swansea
Farmland Museum and Denny Abbey, Cambridge
Geffrye Museum, London
The Hague Municipal Museum, The Hague, Netherlands

Horniman Museum, London

Imperial War Museum North, London
Irish Museum of Modern Art, Dublin
Island Arts Centre, Lisburn, Northern Ireland
Jewish Historical Museum, Amsterdam
Kettle's Yard, Cambridge
Knock Folk Museum, Knock, County Mayo, Ireland
La Grande Galerie de l'Évolution, Museum National D'Histoire Naturelle, Paris
The Lighthouse, Glasgow
London Docklands Museum, London
London Wetland Centre, Barnes, London
Manchester City Art Gallery (The Clore Interactive Gallery)
Melbourne Zoo, Australia
The Natural History Museum, London (Clore Education Centre, 'Investigate')
Natural History Museum website (www.nhm.ac.uk)
National Maritime Museum, London
National Museums and Galleries of Wales, Cardiff
Museum of Scottish Country Life, Killochside, National Museums of Scotland

The New Art Gallery Walsall

Norfolk Rural Life Museum, Gressenhall
Pitt Rivers Museum, University of Oxford
Potteries Museum & Art Gallery, Stoke on Trent
Reading Museum
Roald Dahl Children's Gallery, Buckingham
The Royal Armouries Museum, Leeds
Science Museum, London
Science Museum website (www.sciencemuseum.org.uk)
Scottish National Gallery of Modern Art, (The Surrealist Workshop), Edinburgh
Sea Life Park, Weymouth
Studland Beach Education Centre, Dorset (National Trust)
Tate Modern (Resource Room)
Two Oceans Aquarium, Cape Town, South Africa
Verulamium Museum and Roman Town, St Albans
The Women's Library, London

'I would appreciate time to visit other education spaces for research.'

Education Officer, Gunnersbury Park Museum, London

Acknowledgements

The following people made up the *Space for Learning* Steering Group:

Sally Bacon, The Clore Duffield Foundation
Carole-Anne Davies, Design Commission for Wales
Sylvia Dow, Scottish Arts Council
Sharon Goddard, Heritage Lottery Fund
Hassina Khan, Arts Council England
Louis Moreno & Keith Nichol, DCMS
Dan Phillips, DFES
Ben Spencer, CABE
Julie Street, Museums, Libraries & Archives Council
Gillian Wolfe, Museum Education Consultant

© *Space for Learning* partners 2004

Published by the consortium of research partners listed below. The text of this report is available in a Word version (for large print) and as a PDF file via the partner websites:

Arts Council England
www.artscouncil.org.uk

Arts Council of Northern Ireland
www.artscouncil-ni.org

Scottish Arts Council
www.scottisharts.org.uk

The Clore Duffield Foundation
www.cloreduffield.org.uk and
www.art-works.org.uk

Commission for Architecture & the Built Environment
www.cabe.org.uk

Design Commission for Wales
www.dcfw.org

Department for Culture, Media & Sport
www.culture.gov.uk

Department for Education & Skills
www.dfes.gov.uk and
www.teachernet.gov.uk

The Heritage Lottery Fund
www.hlf.org.uk

The Museums, Libraries and Archives Council
www.mla.gov.uk

Written & researched by Rick Rogers

Project managed, researched & edited by
Siobhan Edwards

Designed by
SteersMcGillan Ltd

Printed by
Emtone

The following people gave invaluable advice on the project:

Norinne Betjemann, Arts Council England
Jenny Deacon, Eureka!
Patricia John & Sean Kenny, DCMS
Billie Lee, Horden Cherry Lee Architects
Ruth Simpson & Marie Costigan, DFES
Sue Wilkinson, Museums, Libraries & Archives Council

Photography:
Images from the following sites have been supplied direct; the individual institutions retain the copyright for their own photography:
@Bristol

Bagshaw Museum
Bishops Wood Environmental Centre
Dulwich Picture Gallery
Dyrham Park
The Lighthouse
Technique Science Discovery Centre
The Women's Library*

*Images of the Women's Library building
© Peter Cook, View Pictures Ltd.

Images from the following sites were taken by photographer, Len Cross for *Space for Learning*:

Bolton Museum & Art Gallery
The Horniman Museum
The River & Rowing Museum
Ulster Folk & Transport Museum

The cover is a composite of images supplied by the individual sites and the photographs taken by Len Cross.

The research partners would like to thank all the case-study sites for agreeing to take part in this research project and for giving so much of their time, energy and enthusiasm:

Catherine Aldridge, Ben Barker and all the staff at @Bristol, Harbourside, Bristol

Brian Haigh of Kirklees Metropolitan Council and all the staff at Bagshaw Museum

John Rhymer, architect Dave Mills and all the participants in the Bishops Wood focus group

David Edwards and all the participants in the Bolton Museum & Art Gallery focus group

Barbara Webber (The National Trust, Wessex Region), Wendy Stott, Susie Gay and all the participants in the Dyrham Park focus group

Carolyn Roberts, Finbarr Whooley and all the participants in the Horniman Museum focus group

Stuart Macdonald, Lesley Riddell and all the staff of the Lighthouse, Scotland's Centre for Architecture, Design and the City, Glasgow

Paul Mainds, Emily Leach, architect Paul Swart and all the participants in the River & Rowing Museum focus group

Dr Anita Shaw, Colin Johnson and all the participants in the Technique Science Discovery Centre focus group

Arlene Bell and all the participants in the Ulster Folk & Transport Museum focus group

Antonia Byatt, architect Clare Wright and all the participants in the Women's Library focus group

And the staff at all the sites who took time to complete the *Space for Learning* questionnaire:

24 Hour Museum, Brighton
Avoncroft Museum of Historic Buildings, Worcestershire
Bath Museum, Bath
Berkshire Medical Heritage Centre, Reading
Bishops Wood Centre, Worcestershire
Brantwood, Cumbria
The British Library, London
British Museum, London
The Bowes Museum, County Durham
Brooklands Museum Trust, Weybridge, Surrey
Captain Cook Memorial Museum, Whitby
Centre for Alternative Technology, Powys
Community Arts Northwest, Manchester
Corinium Museum, Cirencester, Gloucestershire
Cragside, Morpeth, Northumberland
Craven Museum Service, Skipton
Crich Tramway Village, Derbyshire
Croydon Museum Service, Croydon
Dewey Museum, Warminster, Wiltshire
Ditchling Museum, East Sussex
DLI Museum and Durham Art Gallery, Durham
Dorman Museum, Middlesbrough
Dudley Museum and Art Gallery, West Midlands
Eden Project, Cornwall
English Heritage – South East Region
English Heritage – Yorkshire Region
Etruria Industrial Museum, Stoke-on-Trent
The Farmland Museum, Waterbeach, Cambridge
Folly, Lancaster
Gunnersbury Park Museum, Acton, London
Ham Hill Country Park, Somerset
Harris Museum and Art Gallery, Preston
Haslemere Educational Museum, Surrey
The Historic Dockyards, Chatham, Kent
The Holly Lodge Centre, Richmond
Hornsea Museum, Hornsea, Yorkshire
Irchester County Park, Northamptonshire
County Council, Northants

The Jewish Museum, London
Killhope, The North of England Lead Mining Museum, County Durham
Kilmartin House Trust, Argyll
Leicestershire Heritage Services, Lutterworth, Leicestershire
The Lighthouse, Glasgow
Livesey Museum for Children, London
The Living Rainforest, Hampstead Norreys, West Berkshire
London Borough of Bromley – Countryside Ranger Service, Farnborough, Kent
London Wetlands Centre, Barnes, London
The Lowry, Salford Quays, Manchester
Lyme Regis Museum, Lyme Regis
Macclesfield Silk Museums, Cheshire
Manor House Museum, Bury St. Edmunds
Museum of Childhood, London
Museum of Kent Life, Sandling, Kent
Museum of London, London
Museum of Oxford, Oxford
Museums of the Royal College of Surgeons of England, London
Museum of Welsh Life, Cardiff
Nantgarw China Works Museum, Nantgarw, South Wales
National Army Museum, Chelsea
The National Gallery, London
National History Museum, London
National Portrait Gallery, London
National Maritime Museum, Greenwich
National Museum and Gallery, Cardiff
National Museums of Scotland, Edinburgh
National Railway Museum, York
National Wetlands Centre, Llanelli, Wales
National Woolen Museum, Carmarthenshire
Norwich Castle Museum and Art Gallery, Norwich
Orkney Heritage, Orkney
The Photographers' Gallery, London
Portsmouth City Museums and Records Service, Portsmouth
Powysland Museum, Powys
Ragged School Museum, London
Reading Museum Service, Reading
Red House Glass Cone, Wordsley, West Midlands
Roman Legionary Museum, Caerleon, Wales
Royal Armouries, London
Sheffield Galleries and Museums Trust, Sheffield
Sheffield Industrial Museums Trust, Sheffield
Sherbourne Museum, Sherbourne, Dorset
Theatre Museum, London
Towner Art Gallery, Eastbourne
Tynedale Council Museums Service, Hexham
Tyne and Wear Archives Service, Newcastle-upon-Tyne
Tyne and Wear Museums, Gateshead
Ulster Folk & Transport Museum, County Down, Northern Ireland
University of Durham, Oriental Museum, Durham
University of Leeds, Special Collections, Leeds
Victoria and Albert Museum, London
Walsall Museum, Walsall, West Midlands
The Waterworks Museum, Hereford
Welsh Slate Museum, Llanberis, Wales
The Whitworth Art Gallery, Manchester
The Wildfowl and Wetlands Trust Slimbridge, Gloucestershire
The Wildfowl and Wetlands Trust Welney Centre, Cambridgeshire
The Wildlife and Wetlands Trust, Washington
Wiltshire Heritage Museum, Devizes, Wiltshire
Wisbech and Fenland Museum, Cambridgeshire
Woodhorn Colliery Museum, Ashington, Northumberland
Worcestershire County Museum, Hartlebury Castle, Kidderminster
The Wordsworth Trust, Grasmere, Cumbria
Worthing Museum and Art Gallery, Worthing
Yorkshire Sculpture Park, Wakefield

To purchase additional copies of the report, please send a cheque for £5.00 (inclusive of p+p), made payable to Education Direct: *Space for Learning*, PO Box 105, Rochester, Kent, ME2 4BE