Engaging with books you cannot touch: interactive multimedia to expose library treasures

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Engaging with Books You Cannot Touch: Interactive Multimedia to Expose Library Treasures

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Interactivity has proved a successful way to engage visitors of science museums. However it is not a common practice when the objects to exhibit are artefacts or, as in the case of this paper, books. A study was set up to investigate the driving criteria for the "The Life and Work of William Butler Yeats" exhibition at the National Library of Ireland and compare those with the visitors' opinion. Books, notebooks and personal belongings of the poet have been digitized and used to create a rich and varied exhibition that used both interactivity and multimedia. The result of visitors' survey showed that the variety was a key factor for the success of the exhibition: different people engaged with different contents and different medium to different degrees. The design of the ambience is critical: dim lights and the use of audio as a medium have to be carefully planned to avoid annoying instead of engaging.

Keywords: digital imaging; library exhibition; interactive multimedia.

1 Introduction

Many different kinds of technology have been used or experimented in museum settings: from traditional stationary multimedia kiosks, to mobile and adaptive guides (Petrelli & Not, 2005, Zancanaro et al. 2003), wearable devices (Sparacino et al. 1999) and virtual reality (Sparacino 2003, Rousseauu 2001). Each of them has advantages and disadvantages: multimedia kiosks are rich in information but limited by their location that can be away from the artefacts being described (Ciolfi & Bannon, 2003); PDAs are less physically constrictive than kiosks and have similar functionality, however as they are designed for individual use can disrupt the social nature of museum visits (Vom Lehn & Heath, 2003); wereable and virtual reality have a novelty factor, but to be effective for learning they have to hold visitors' attention beyond the initial surprise (Rousseau 2001).

However different in the technology used, each of the above offers a single interactive point. This contrasts with the evidence coming from evaluating visitors' experience that a multi-sensory mixed medium strategy is the most successful (but for the very quiet and solitary visitor (Davison et al. 1994)). Indeed evidence shows that a mixture of traditional presentations (cases with artefacts, dioramas, graphic panels, labels) supported by hands-on sensory components (touch, listen, smell) and interactive problem solving is the most successful solution for audience engagement in science museums (Davison et al. 1994). An open, non-didactic information structure that includes multiple views and activities can be successfully applied to interactive technology (Leslie & Gleeson 2005). The challenge is to plan the whole exhibition (not just one interaction point) and assure that each part is self contained but at the same time integrates and complements the others (an excellent example of such an approach is in Ferris et al. 2004). The role of a modern museum is not any

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more that of exhibit significant artefacts, but the one of creating experiences for visitors (Cauton 1998). Pushing the boundary further, constructivist museum theory emphasises the learning process over the actual body of knowledge: a visitor does not merely absorb information, but constructs new knowledge by interacting with content and assimilating it into what is already known (Leslie & Gleeson, 2005). To be effective an exhibition has to allow individuals to explore multiple narratives and construct knowledge through exhibits which present multiple scenarios and outcomes (Leslie & Gleeson, 2005).

In line with the transformation museums are experiencing, the library is less important as a physical place that provides access to books (as collections and catalogues can be used online) and more as a space to facilitate accessing and acquiring knowledge. The possibility of digitizing precious books and made then available to the public through interactive technology (like Turning the Page[1]) is core to this transformation. However, while museums had been the focus of much research (for an overview of recent trends see Ciolfi et al. 2005), little has been done in libraries as it is much harder to engage visitors with what are primarily text-based artefacts. The National Library of Ireland has recently experimented with interactive and multimedia technology in two exhibitions based on the lives of the prominent Irish literary figures Joyce and Yeats. While the Joyce exhibition, the first of the kind, was limited in scope and technology used, in Yeats' one the principle of a multi-sensory open-ended interaction guided the design. Technology has been used not only to present rarely seen artefacts (e.g. manuscripts), but to interpret them in different contexts supporting the visitors in a wider exploration of the writer and his work.

This paper reports a study done in during the initial opening of 'The Life and Work of William Butler Yeats' in early Summer 2006 and carried out to investigate if the intentions and aims of the curators and the designers have been received by the visitors and how. One of the curators and two exhibition designers have been interviewed to specifically identify the driving criteria for the exhibition; questionnaires were used to collect visitors' opinion and a tour guide was interviewed to better understand the questionnaire result.

2 'The Life and Work of William Butler Yeats' at the National Library of Ireland

The Life and Works of William Butler Yeats exhibition opened at the National Library of Ireland in May 2006. Put together over a period of two years, it was intended to promote and illuminate the Library's burgeoning collection of Yeats manuscripts, notebooks and correspondences, as well as his own personal library. The exhibition benefited from the work of five dedicated exhibition staff in the Library, a team of designers from Martello Media, input from several scholars, artworks by various artists, and the guidance of a film producer.

Given the material is mainly paper-based, the exhibition makes great use of digitalized images and interactive computer technology to provide depth and detailed content. More traditional communication methods like graphic boards and cases, audiovisual installations and replicas of places and artefacts are used to complete the visit experience. This result in a variety of different but inter-related zones designed to engage the audience at intellectual, interactive and visceral level.

2.1 Structure and Layout

Best known to the Irish public as a poet and playwright, Yeats is one of Ireland's most important literary and cultural figures. The structure of the exhibition is biographical, beginning with Yeats' origins and family tree and ending with his death and funeral in 1936. Visitors are not explicitly directed (no arrows or maps); the

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[1] http://www.bl.uk/onlinegallery/ttp/ttpbooks.html

layout invites to naturally move from one phase to the next in a circular way. The general setting is dark with the lightened elements (cases, interactive points, audiovisual settings) to attract visitors' attention.

Aspects and periods of Yeats' life and work are presented in separated "islands", each represented by a 'Signature Image' and a different colour theme. Signature images are reproduced on large wall boards and are displayed as screensaver on interactive touch screens (Fig. 1). Four evocations (reproductions of rooms) with the associated four films focus on particular aspects of Yeats' life, while the replicas (reproduction of artefacts), the cases and the turning the pages focus on particular objects. The two interactive installations in the centre of the circle, The Tower and Poetry in Print, provide in depth understanding of Yeats' work and complement each other. The technology used in each of these islands is described in more detail below.

2.2 Audiovisual Experience

The welcome to the exhibition is the 'Verse and Vision' space, a circular reflective area where people can sit and listen to Yeats' poetry and watch the words and related images appear on four large high screens (Figure 2).
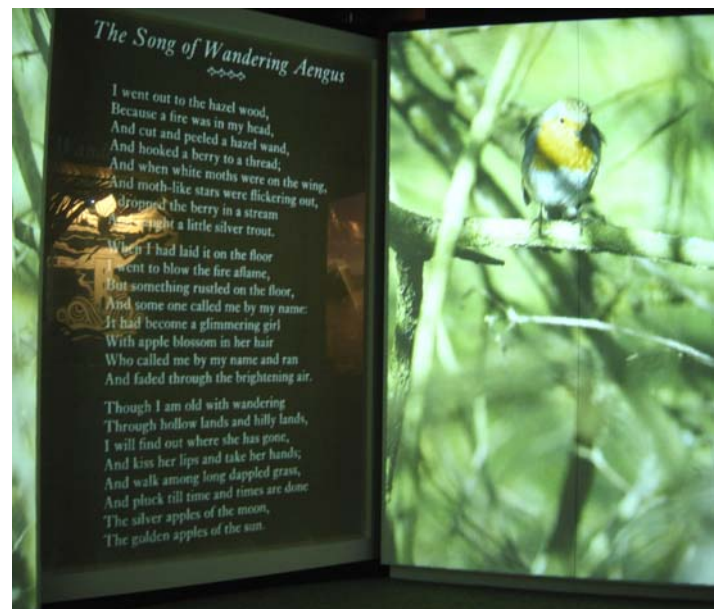

Figure 1. Signature Image and touchscreen.

Figure 2. Verse and Vision installation.

Four significant locations in Yeats' life are recreated in the 'Evocations', small curved enclosures located in different points of the exhibition and related to specific periods in his life. Each Evocation has an associated documentary film describing: important women in the poet's life (Affaire of the heart), the relation with theatre (Players and Painted Stage), the interest in the esoteric (The other world) and his public and political role (The Mask).

2.3. Information Points

Touch-screens and interactive points are distributed all around the exhibition with different functions depending on the context. Touch-screens placed under Signature Images (Fig. 1) provide an overview of the

period. A selection of manuscripts from the library's collection is on show in display cases together with photographs and artefacts lent by the family. The touch-screen nearby (Fig. 3) provides a means to examine the contents of the display cases more closely. Each display case and its contents are exactly represented on the touch-screen: by touching an object visitors can view it in more detail (zoom in) as well as get information on it.

2.4 Digital Reading Points

Following the public success recorded during Joyce's exhibition, two Turning the Pages[2] installations are available to enable the audience viewing Pail (Fig. 4) and Rapallo notebooks at such as high level of detail that even the grain of the paper is apparent on the screen. The installation uses a book metaphor for interaction: users turn the page by dragging its corner across the screen. A side description introduces the page and visitors can zoom in a page to read Yeats' personal notes.

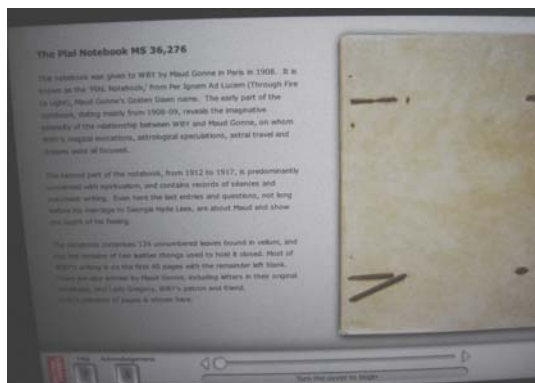Figure 3. A display case and the related touchscreen.

Figure 4. Turning the Pages Installations

2.5 Interactive points

Two further installations aim at supporting a deeper exploration of Yeats' work: the evolution of the collection of poems The Tower and the poet direct involvement with the production and publication of his books.
The Tower is a semicircular structure (Fig. 5) displaying a map of the process leading up to the creation of the Tower, from the writing of the first poem, to the intermediary stages and the final book's publication. The same process map is displayed on two touch screens (Fig. 6) where users can view the book in detail and access further information. A master class tutorial can be accessed by touching various locations on the same map.

The Poetry in Print installation allows visitors to explore Yeats desire to be involved with the work related to the publishing of his book, including the illustrations, binding, type, and even the paper on which it was printed. The installation includes a display of Yeats' book art alongside two touch-screens which illustrate the process behind the design and provides insight into the work of the designers involved.

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[2] Designed and developed by the British Library and Armadillo Systems http://www.turningthepages.com/
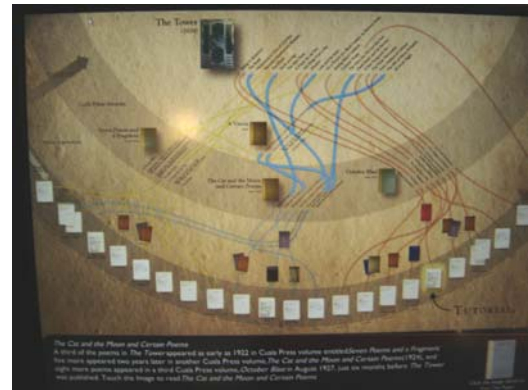
Figure 6. The touchscreen of The Tower.

Figure 5. The Tower installation.

2.6 Replicas

Digital images have been exploited to create simple and effective interaction objects. Few everyday objects have been recreated to render Yeats a more real person. His passport and the scrapbook of photographs of his family (Fig. 7) have been physically reproduces and let for the visitors to explore.

A questionnaire filled in by Yeats on creativity has been reproduced on a wallboard, enlarged enough to make his quite intricate writing as legible as possible. Though this is a more traditional way to communicate content in museum settings, it shows how digital images can be used to increase the impact of artefacts on visitors.
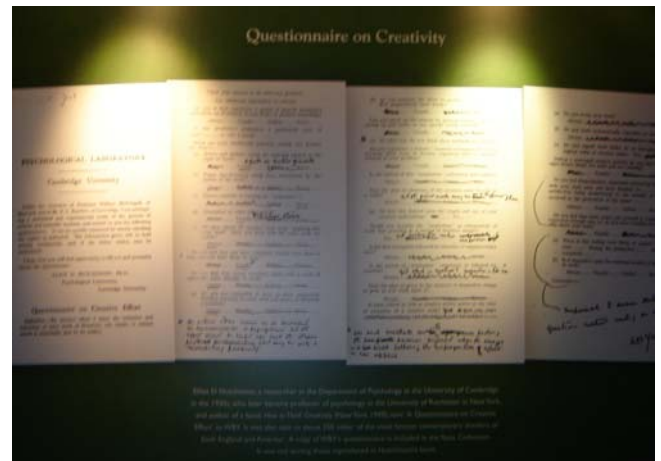

Figure 7. Yeats' photo album replicas.

Figure 8. The questionnaire on Creativity.

3. The Study

As described in the previous section, The Life and Work of William Butler Yeats is an ambitious exhibition that uses a range of traditional (boards), interactive (replicas) and technological (touch screens) installations to affectively engage visitors with a collection of (mainly printed) material. A study was set up to investigate if the aims of the exhibition design team have been perceived and appreciated by visitors.

A multi-methods approach was used: a curator from the National Library of Ireland and two of the designers from Martello Media were interviewed to determine their individual perspective; a survey questionnaire filled by visitors while exiting the exhibition was used to understand the audience experience; finally a tour guide was interviewed to better understand the result of the survey. Interviews were transcribed and coded; surveys analysed statistically. Main results are summarized below, details can be found in (Reilly 2006).

3.1 Curator and Exhibition Designers Intents

Two semi-structured interview schemas were used with the curator and the designers. While the interview with the curator took place individually, the interview with the designers was done in pair. Interviewing the two together produced a richer set of data as they not only responded to the direct questions, but also raised questions of their own for the other to answer. A dialogue emerged between the two as they corroborated each others recollections and added to each other's responses.

A clear role division emerged between curator and designers: the curators of the exhibition decided the content, including the objects to be displayed, the signature images to be used, and the information content of the interactive installations. Much of the layout and all of the technical aspects were left up to Martello Media to design.

3.1.1 Aims and Layout. Curator's and designers' aims were obviously different but complementary. The curator wanted to expose the library treasures to the widest possible audience in a complete and coherent way in order make Yeats person and work unveiled and explained. Of particular interest was to present less known aspects of the poet's life, e.g. the interest for occultism and his political involvement. Designers were more concerned with exploring new ways of exploiting digital interaction while presenting the manuscripts in the Library at their best. Both curators and designers wanted to address a wider public than scholar.

The curator and the designers focused on different aspects of the exhibition layout: the curator on the organization of the content, the designers on the appearance. The curator discussed the autobiographical or chronological order that develops along a full circle around the room, "starting off with his early life and going right through to his epitaph".

The designers mainly discussed the sensorial and aesthetic aspects of the layout: a dark space with text displayed on screens in reverse (while on black background) to avoid white bright squares that would clash with the signature image nearby; the touch-screens suspended on poles that become an element to design the space; the use of warm and cold colours to underline Yeats' lunar cycles.

3.1.2 Content Selection. Discussions seemed to have occurred while the content was selected, although the curators were the ones who decided as they were both experts and knew the content of the collection. Novelty seems to have been the driving force in the content selection for the curator: 'material that the family would have donated', 'things that people haven't seen before that are considered important', 'manuscripts […] never seen before because it's never been put on display'.

Designers pointed out that initially curators planned to exhibit only manuscripts (as previously done in the Joyce's exhibition), but where suggested including 'life cases' and 'stuff about the people', implemented in the exhibition by showing Yeats' passport or the filled questionnaire. Designers requested images that 'could

be treated thematically similarly' but the actual selection was done by the curators as 'they know which image is important and how they link to each other'.

3.1.3 Digitisation. As digital surrogates were at the bases of the exhibition, a section of the interview investigated the work done to digitize original material and the perceived value. Martello Media was mainly responsible for the digitization: different devices (scanner, camera, photographic table) were used depending on the material in hand and the expected use of the digitized image (e.g. the 2 meters high signature images). The digitization process was done iteratively as new material was selected for display.

The digitization is perceived by the curator as an outreach more than a preservation tool: '[of] a book you can only display the front or the back of a page whereas with a touch-screen you can show …you can see the cover and flick through inside' 'turning the page technologies [..] really does give people an idea of the book'. The composition of a DVD of the exhibition was mentioned as an important result of the digitization.

Digitization for preservation was mentioned instead by the designers. They also highlighted the possibility to show every detail of every single page of the most delicate manuscript to everyone: 'It's like a democratic access to objects that you couldn't show otherwise'. Interestingly they pointed out how the digitized images can be overlapped with other material: 'you've got the manuscript there in front of you untouched but then you can layer information over it, highlight the various areas because the manuscript can be hard to interpret, the handwriting isn't always easy to understand, so you can highlight things, do the transcripts and all that and then you can wipe it all away again.'

3.1.4 Interactive Installations. Both the curator and the designers highlighted the fact that the interactive installations allowed to offer many more objects that what was physically possible: 'There are 400 objects on display and a further 2500 represented through the touch screens'. Displayed objects become starting points for navigation in a wider information space.

Another common comment was the possibility the interactive installation offer to explore complex in-depth concepts, the process of writing, the changes and the stages. The curator mentions the gaining of a deeper understanding, a more enjoyable experience and the stimulation of a more exploratory attitude as advantages of the interactive installations. The designers mentioned the possibility of providing multilingual captioning and the advantage of not overloading the wallboards with text (aesthetic) while 'having a real expert over the shoulder telling you into you ear exactly how it is'.

3.2 Visitors' View and Tour Guide Opinion

A questionnaire aiming at investigating visitors experience was distributed over a period of a week and had 148 respondents. The questionnaire consisted of fourteen closed and open-ended questions about: personal and group profile; their visiting experience (expectations, use of interactive installations, favourite exhibit); and their learning experience (general as well as particular).

The lack of control over the sampling process might have had an impact on the data collected: since it was entirely up to the visitor whether to respond or not, those who either had a very positive experience or a very negative experience may have been more motivated to fill out the questionnaires. In order to balance the questionnaire result, the tour guide was interviewed about her observations of visitors' interaction with exhibits.

3.2.1 Visitor Survey Result. The age of respondents was quite varied: 9% were children under 12; 7% teenagers; 16% between 18 and 30 years old; 37% between 31 and 55 and 30% above. Considering the topic of the exhibition (a poet) and the time (out of school time) these percentages with a majority of adult people should be expected. Visitors came with: a group 9%; the family 7%; friends 37% and alone 30%. The

percentage of respondents who visited alone is very high; this could be due to the fact that the exhibition is in the Library, a place where it is likely to go alone[3].

The global feedback was extremely positive with the majority of respondents (59%) that stated the exhibition exceeded their expectation; 30% who liked it and only 6% who said it did not meet expectation or 3% did not like it.

Two questions asked which was the most and least favourite exhibit. Tables 1 and 2 below show the answers (in numbers of respondents and percentage). As the question was open for respondent to write their opinion not all respondents filled in this field and the answers are quite varied. 93% of respondents decided to write their favourite exhibit, while only 34% wrote their least liked one.

Verse and Vision and the Evocations were the most favourite (if the instances related to evocation listed by visitors are added – Abbey, Study, Occult, Women, Georgie, Esoteric – the percentage rises at 24%). Next favourite was the touchscreen preferred by 10% then there is a spread of other preferred items. Interestingly, The Tower, surely the most complex and challenging of the installations, was the favourite of one visitor.

Physical aspects of the exhibition feature prominently as a least favourite aspect: sound (9%), darkness (4%), too much (4%) etc. The wide range of media used in the small space of the exhibition caused a conflict in audio presentations while darkness was necessary for the conservation of the artefacts on display. The audio was perceived as a problem wherever it was used, i.e. Verse and Vision, Evocations, and the tutorials on the touchscreens. To avoid this inconvenience and keep the social dimension of a shared experience directional audio devices should be used.

Verse and Vision and Evocations seem to be controversial items as they are the most disliked exhibits mentioned. The majority of respondents who disliked Verse and Vision were children that instead listed the replicas as their favourite. Both results are not surprising as listening to poetry is a passive and reflective experience, while children are likely to prefer a hands-on approach.

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[3] No question investigated if the visit was planned or happened because the person was already in the Library.

Most Preferred Exhibit		
Verse & Vision	43	29%
Evocations	20	14%
Touchscreen	15	10%
All	12	8%
Replicas	7	5%
Artefacts	7	5%
Abbey	6	4%
Manuscripts	6	4%
Occult	5	3%
Wall Displays	2	1%
Women	2	1%
Study	2	1%
Objects	2	1%
Tour	2	1%
Tower	1	1%
Information	1	1%
Esoteric	1	1%
Georgie	1	1%
Influences	1	1%
Family tree	1	1%

Table 1. Answers to 'What's your favourite part of the exhibition'.

Least Preferred Exhibit		
Sound	13	9%
Evocations	7	5%
Verse & Vision	7	5%
Darkness	6	4%
Too much in exhibit	5	3%
Exhibition cases	3	2%
Manuscripts	3	2%
Wall displays	3	2%
Too many people	1	1%
Too much in small space	1	1%
Not enough seating	1	1%
Not enough poetry	1	1%

Table 2. Answer to 'What's your least favourite par of the exhibition'.

Respondents who disliked the evocations primarily dislike their content, in particular the evocation relating to the occult. This may be because of the new and controversial nature of this aspect of Yeats' life.

A set of questions specifically investigated the experience with the touchscreens. Of all those who responded, 85% interacted with the touchscreens while 10% did not. The reason for not using it were: not enough time (2%), no interest (2%), do not know how to use it (2%), do not like it (1%), too loud (1%), too crowded (1%). Of those who have used the touchscreen 93% said it was easy; the 7% who had difficulties stated that it did not work, the content was not interesting or too cluttered, that was too loud. The fact that 6 people said the touchscreens did not work does not mean necessarily that the technology is not robust: the short time of the survey and the fact that it was early in the opening[4] may have produced data unrepresentative on the long run. When questioned, 86% of respondents agreed that interacting with the touchscreens added something to the experience and 63% stated they have learnt some by interacting that they would have not found elsewhere in the exhibition (7% disagreed and 30% did not answer).
The last two questions aimed at understanding if the exhibition had been successful in terms of new knowledge acquired: 70% said they have learnt something new, while 5% did not (25% did not answer). The topics that was new to the most respondents was Yeats's interest for the occult (14%); this was expected as it is an aspect of Yeats' file that only recently came to the attention of scholars.

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[4] Problems are likely to emerge soon when installation are in place, later set and solved.

What has been learnt		
Occult	16	16%
Yeat's Personal Life	14	14%
His Work	11	11%
Affairs	9	9%
Family	8	8%
Women	7	7%
Relationships	6	6%
Political life	5	5%
Everything	5	5%
Influences	4	4%
Abbey Theatre	4	4%
Work Process	4	4%
Georgie	3	3%
Political situation	1	1%
	97	

Table 3. Answers to the question: 'describe one new thing you have learnt'

Facts on his private life was a novelty for 14% of visitors, that could be extended to include answers like: affairs (9%), women (7%), relationship (6%), political life (5%). Considering Yeats is known as a poet, it is somehow surprising that 11% stated as they have learnt something new about his work: this indicate the exhibition has been successful in making Yeats' poetry better known and appreciated. Another interesting answer is the 4% of people who listed the work process as new learning; this is likely to refer to The Tower installation showing that even very complex content can be appreciated, even by just a minority.

3.2.2 Visitors as Observed by the Tour Guide. The role of the guide during the half hour long tour of the exhibition involved leading groups through the biographical path of the exhibition, providing an overview of each thematic area, drawing visitors' attention to particular exhibits and displays, and providing a demonstration on how to use the interactive touchscreens.

Visitors' feedback as perceived by the guide was generally very positive and many said it was necessary to comer back to take in all the information. Complaints were limited to the poor lighting, but the situation was easily accepted when conservation reasons were explained and the function of the touchcreens to see the objects in more detail proposed.

The guide suggested that older people did not interact with the technology very much while children loved it.

A Chi square test of the correlation between age and use of the touchscreens showed that age does not have any bearing on the dislike of technology. This may be because of a preconception, similar to that disproved in the Petrelli and Not (2005) study, or it may be that the tour guide were asked by older visitors to show them how to use the screens, giving then the guide the impression that older people were unsure on how to interact while at the same time giving these visitors the encouragement and know-how to use it.

4 A Hybrid Approach Is the Key to Affective Communication

The aim of the exhibition as derived from the interviews was, not only to showcase the collection, but to reach out to as many people as possible and illuminate previously overlooked areas of Yeats' life. The range of content, the broad spectrum of respondents to the questionnaires, and the answer on what was learnt show that all of objectives were achieved.

The wide range of favourite aspects show the array of preferences exhibition designers have to cater for and emphasises the importance of using several methods for a successful engagement with the audience. The combination of items and concepts exposed should be as varied as possible. Although the initial plan was to use only manuscripts, the inclusion of everyday objects and personal items (e.g. the questionnaire) made the Yeats' exhibition more lively, approachable and enjoyable than the only exhibit of his work. The first challenge for exhibition designers is to identify a variety of content that can appeal different people.

The variety of content was matched in Yeats' exhibition by the variety of media used: more passive presentations (listening to poetry or watching videos) where interleaved with electronic interactive points (touchscreens and turn-the-pages installations) and more traditional touch-and-feel objects (replica of the passport and the family album). As not all visitors are excited by, or interested in, technology, this variety allowed each individual to engage with the modality they felt more comfortable with. Moreover the position of the interactive cases and the use of audio instead of text to convey content allowed passive visitors to acquire information by watching while someone else interacted. The second challenge is then to plan for different attitudes and abilities and design the digital interaction to support a 'social access' to the information.

To ensure that different media are seamlessly integrated effectively in the ambience is a further challenge: the content, the media and the environment have to be designed together to create a holistic experience. Particular attention should be paid to invasive media like audio: quite visitors may feel inhibited in the interaction if they perceive the narrative may annoy other visitors.

The presence of artefacts as mean in the learning experience was brought into question by the lack of respondents who mentioned the artefacts as their favourite part of the exhibition. This could be due to the excellent use of the digital images that recreated the sensation of interacting with the original both with a physical replica and its electronic reproductions. Indeed digital surrogates were used all across the exhibition in both high-tech (interactive displays) and more traditional (the wallboard questionnaire (Fig. 8)) forms. By mean of digital images the Library was successful in driving attention to Yeats' literary work and, ultimately, to fulfil its role.

The exhibition demonstrates the value of digital multimedia in creating engaging and stimulating environments. Through digital interaction it was possible to expose more artefacts and more information than what the space allowed (the exhibition has 400 items exposed and 2500 electronically available). The use of the digital medium allows to provide visitors with a choice and layers of information and supports personal attitude as each individual can investigate more or less of each issue. The role of an exhibition designer in than that of proposing to the public multiple paths of visits and leave each visitor free to select the mode and the level of engagement.

In summary, as for science museums (Davison et al. 1994), a mixture of more traditional presentations (cases with artefacts, reconstructions, graphic panels) supported by multimedia (audio and video, touchscreens) and hands-on sensory components (touch replicas) demonstrated to be the key for success even when the focus of the exhibition is composed by difficult objects like manuscripts.

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