THE ARTICLE DISCUSSES OUR EXPERIENCE WITH THE INTERDISCIPLINARY DIGITAL MUSEUM UNIVERSITY COURSE WHICH FOCUSES ON COMPETENCE AND PROJECT BASED LEARNING IN REAL-LIFE SETTINGS.

DIGITAL MUSEUM: A MULTIDISCIPLINARY UNIVERSITY COURSE

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ABSTRACT

Our "Digital Museum" university course was launched in 2010, as a response to the challenges and needs of museums in the information age. It is novel in several ways. Students develop museum projects in multidisciplinary teams. They are studying Design, Management, Education and Art Theory at our university and Programming at a Technical university, and are introduced to the latest digital technologies. They invent solutions that will turn museums into appealing, engaging social sites that are attractive to their generation. The course applies a problem solving design methodology. Problems are spotted and possible remedies proposed in brainstorming sessions, then the most promising ones are critically reviewed with respect to available resources and other matters, and a detailed design is produced. Students play different roles and are responsible for creating content and visual designs, programming and project management. At the end of an intense, one-term course, teams present prototypes for museum clients. Some student projects have been developed into applications in everyday use in museum settings. In this paper we argue the social case for the course, explain our methods and the lessons we have learned and present some projects our students have developed.

KEYWORDS

Museums, Design Education, Digital Technologies.

The case for reinventing the museum

We launched the Digital Museum course at our university in 2010 in response to the explosive developments in digital technologies, the need to change museum practices and and to identify new roles for art and design students. Museums sense the need to adapt so as to remain attractive for new generations (Anderson 2012, Simon 2010). And today many of them realize that digital technologies offer new means to achieving many of their goals. These include: whetting appetites for visits, turning an exhibition into a memorable experience, providing interactive learning modes, engaging visitors through games and multisensory experiences, making collections accessible to a broader public, enabling them to participate as responsible partners, encouraging visitors to contribute in a creative way, to give feedback, to reuse and remix content, to collect photos and information to take home; and exploiting social media for communication purposes. The need for change has been explored in conferences (e.g. MuseumNext, NODEM and MuseumWeb) and essays that have offered practical solutions. Admirable examples ranging from (mobile) applications to interactive sensory installations, can be experienced for instance at the Chopin Museum in Warsaw, Science Museum in London, and at Gallery One in the Cleveland Museum of Art.

New roles and challenges for artists and designers

Exploiting technologies necessitates understanding what is possible today, not just in a technological sense, but also how to use to create the new nonlinear genres of narrative in which visitors participate. Good installations achieve this in inventive, poetic even magical ways while communicating the central message of an exhibition and a museum's goals. Artists and designers exhibit the sensitivity, aesthetic taste and creativity that are necessary for inventing and designing these kinds of applications and installations, and can usefully supplement the work of specialist museum staff.

Unfortunately the way art and design students were taught work attitudes and skills in the past is inappropriate. They need to learn how to realise ideas in collaboration with experts in other disciplines, ranging from programmers, to curators and scholars. Traditional art and design courses at universities do not prepare them for this. They are not introduced to enabling technologies or given chances to work in multidisciplinary teams, and in most cases, are not exposed to the challenges of working and communicating in real-life conditions (Boud, Solomon 2001, pp. 3-17).

The Digital Museum Course

Our Digital Museum course responds to developments in competence-based education, and the challenges for art and design higher in education in the 21st century (Bowden, Masters 1993, pp. 44-63). When designing the course we had in mind that, students should be:

- Socially sensitive and able to contribute to the overall wellbeing of society;
- problem-seekers and problem-solvers;
- ready for interdisciplinary collaboration;
- fit to work in teams;
- able to make good use of newly developed technologies, particularly in ICT;
- motivated to act on an international professional scene.

The course gets launched annually, after we have set up a framework for collaborative partnerships with museums and identified mentors, we use a new set of 2–4 museums each time. The course is open to all MA and BA2 students from Visual Studies (Animation, Graphic Design, Photography and Media Design), Design Studies (Industrial Design, Textiles, Jewellery) and Architecture, together with students in the university's Theoretical Institute (Managers, Scholars of Art and Design, and Teachers). Additionally we accept students from the Budapest University of Technology and Economics who are studying Programming and Mobile Technologies. Although the museums determine the course content, the structure throughout the 12-week term is the same each year, and follows the same 'design thinking' methodology explained below (Fatima 2013):

- Identifying problems museums face, an introduction to the potential of technology for renewing museum practices, and analysing international examples of good and bad practice.
- Students visit the partner museums and become acquainted with the physical environment, people, programs and plans (e.g. for new exhibitions). The museums propose briefs specifying broad objectives and/or problems.
- Students brainstorm, get feedback from mentors and museum experts, and present their own project proposals. (2 weeks)
- In the framework of an 'auction' ideas get pitched, and interdisciplinary groups are formed to develop further the most promising and popular ideas. Care is taken to ensure that all the necessary competences – project management, content development, visual design, and programming – are represented in each team.
- Teams set up work plans, decide roles and work accordingly, (mainly on their own), working to an online schedule and in face-to-face consultation with university and museum mentors. Iterative cycles of design – testing – refinement are performed to develop the concept, visual appearance of the application or installation, and the details of the technological aspects. The students collect relevant materials, study literature, consult experts, explore technologies, and consider legal and financial constraints. (6 weeks)
- Towards the end of the course, each team prepares a demo, (preferably with a partially implemented prototype) and documents their project so it can serve as a reference for further elaboration (e.g. for a grant application or full-scale realization).
- In a final presentation session, the teams introduce their projects to representatives from museums and university lecturers.

Challenges

Below we briefly summarize the main challenges posed by a course that is multidisciplinary, collaborative and problem and project based. (Donnelly, Fitzmaurice 2005).

- Because of its multidisciplinary and collaborative nature, the course requires a more flexible structure than is usual at university level, for example, we have to make a common slot in the timetable available for all potential participants and to allow visits to external locations (Lee et al. 2014).
- Because the topic of each project differs, in line with museum briefs, the theoretical modules that provide the background knowledge about the domain vary. They all have to be integrated into project-based work in the form of research. This is the case also with technological aspects.
- A large number of experts are involved in the course from the two participating universities and outside. They often have to invest considerable time in providing specialist knowledge for a project. Managing collaboration is complex for the university, but on the other hand it is one of the main benefits of this course. Teams work on diverse projects and share access to experts and resources at different kinds of museums. It is difficult to establish a single channel of communication that satisfies partners from different age groups with different digital literacy skills. Novice users (both students and partners) sometimes mess the use of standard web2 content sharing platforms. While the students who adopt the team manager role are responsible for ensuring proper channels of communication, they often fail to do so.
- It is very difficult to evaluate teamwork, because the roles members take up are so varied. We use an inclusive assessment model and invite all the team members (the students, their teachers and mentors at museums) to participate (Lee & Lim 2012). We are not fully satisfied with this model, and keep experimenting with and improving it (e.g. by giving a 'sum' mark to the team, which they must distribute among the members).

Examples of projects

In the 5 years we have offered the Digital Museum course students have collaborated with 12 museums in Budapest and developed almost 50 projects. They have designed different kinds of virtual visit, games, installations and 'take-away' items, and proposed novel forms of PR and communication. They have completed projects for museums of Fine Arts, Applied Arts, Music, Literature, Theatre, Medicine and Jewish Heritage. In the following section of the paper, we will describe two

projects. We have documented others on a dedicated web page (TechLab Digital Museum projects 2015).

Musical Paintings

An inconspicuous side room in the Museum of Fine Arts is devoted to Dutch paintings, several of which depict groups of people making music. The brief from the museum was "to render this collection more attractive" to visitors. A group of students set out to design a tablet app to replace the museum's audio guide. Their playful app provide a multitude of information in the form of text, interactive images of 3D models of the musical instruments the pictures depict, and contemporary music written for ensembles like those in the paintings. Visitors are motivated to learn about the paintings in a game-like application in which they hunt for musical instruments in the paintings. The experience involves social encounters too since visitors can exchange their findings. The museum is a huge building and the students have proposed a way of orienting visitors to this particular collection. They located a lute maker from rural Hungary and a PhD student from the Academy of Music and drew on their expertise to help them identify and model musical instruments from the past.

Interactive Poetry

An exhibition entitled "Words Stirred" took place in 2013-14 at the Petőfi Literary Museum to commemorate the Hungarian poet Sándor Weöres. He is famous for the strong rhythms and musical effects in his poems as well as for his witty and inventive use of language. The museum commissioned us "to invent something that would engage the public other than a traditional showcase containing personal relics of the poet and first editions of his works." They wanted a response in line with the personal mission of the poet, who encouraged his audience "not to admire, but to use" his poems. Our team consisted of students who had already proven themselves on a previous Digital Museum course; alumni with various kinds of expertise (textile designers, an animator, a graphic designer, media designers) and programmers from the TechLab and beyond. Our exhibition was organized around 11 installations that invited visitors to experience poetry in completely new ways; for example by letting lines of poetry emerge on a touch-screen under a pen, listening to poems 'spoken' by light, textile sculptures of the fruit they mentioned, and discovering the poet's universe by travelling through a 3D galaxy. A film of each installation is available online (Weöres100 2014). Below are descriptions of two installations that give a taste of the designers' creativity.

Tangible Poems

The poems were "printed in 3D" on the surfaces of cylinders, that enabled visitors to sense their rhythm under their fingertips, by physical touch. Smaller and bigger bulges correspond to the length and the height of each syllable of each line of text. The visual and tactile impressions give an overall feeling of the dynamism and music of each poem. When a cylinder is placed on a certain spot, it reveals the poem: its textual form gets displayed. This multisensory learning experience helps to figure out principles of metric poetry in a playful way.

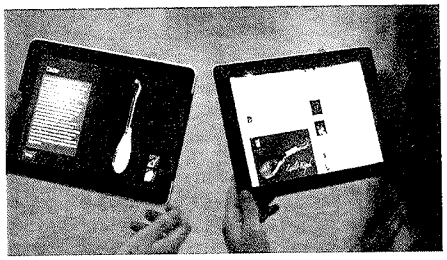

Figure 1. Musical Paintings app. Users can explore 3D models of instruments they discover in paintings and share them with other visitors. Source: R. Sárosi.

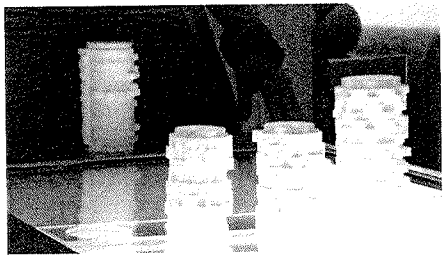

Figure 2. Tangible Poems. The rhythm and music of poems are visualized in the form of 3D prints. When they are held in the hand, the dynamism and rhythmic patterns of poems can be sensed under one's fingertips. Source: R. Sárosi.

Figure 3. Blown Thoughts. When visitors blow the dandelion, letters dance around and eventually settle to form lines of a poem. Source: WB. Samu.

Blown Thoughts

The most perplexing installation is a dandelion head engraved on a standing sheet of plexiglass. It is not accompanied by any instructions. Visitors who want to recall childhood memories, can take a deep breath and blow on the dandelion wisps. When they do this, dancing letters emerge on the wall instead of seeds and settle eventually to form the lines of a poem. Visitors are amazed by the poems they create just by blowing and probably pay more attention to reading them than they would with a printed text.

Conclusions

Students praise the Digital Museum course because it offers them new experiences. They like working with students from other disciplines on designing solutions to 'real-life' problems and last, but not least, seeing their own ideas take shape and put to use. Their communication, writing and oral presentation skills improve a lot, since they have to present and discuss ideas at almost every phase of the project.

Almost without exception, the museums consider the students' projects very creative and pleasing to look at and are eager to see them realized. They learn about potential uses for digital technologies through collaborating with the university.

But problems have emerged that are inherent in the nature of complex cooperative schemes with content and methods that are novel for both students and the mentors.

- Students are reluctant to criticise each other and articulate differences in their dedication to the quality of their work.
- For the Art and Design students who are used to working alone and being assessed on their individual performances, meeting internal deadlines and following the communication protocols that are essential for successful collaboration is a huge challenge.
- Some students are not willing to accept constraints and criticism from partners from other professions (museums or programmers). They consider this a violation of their artistic freedom, or attribute problems to generational differences.

It has been interesting to listen to past students re-assessing difficulties in retrospect, stating that after gaining real work experience, they understand the importance of agreeing schedules, roles and communication strategies.

Recently our university – like many others – has been rethinking the role of designers and the best way to educate them. We are creating more space for courses like this one, involving interdisciplinary, project-based learning, cooperation with real-life partners, and learning through doing. Their proliferation poses further questions and challenges at university level.