

# ENHANCING LEARNING

## Potentials of virtual libraries and repositories

Joergen Bang,  
Department of Information and Media Studies, Aarhus University  
Helsingforsgade 14, DK-8200 Aarhus N, Denmark  
[jbang@imv.au.dk](mailto:jbang@imv.au.dk)

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### 1. EXECUTIVE SUMMARY

Libraries, museums and galleries are repositories of huge cultural heritage which when made accessible through digitisation and organised in databases become educational resources. As such they may become keystones for new learning activities that enhance intercultural understanding by adding a European dimension to education. But learning resources only have an active role in the learning process when the learner is doing something useful with them. Thus the creation of relevant learning processes and activities become essential.

Successful learning activities, processes, and collaborations relate to the social and cultural environment of the learner, mobilise capacities, such as current knowledge and cultural heritage, and establish a dialogue with the new learning resources thereby forming the basis for learning. In the future learning environments should bridge the gap between formal and informal learning with a focus on enhancing knowledge acquisition and sharing regardless of whether the provider is an educational institution, museum, gallery, library or mass media supplier. The challenge is to create an open learning environment, which can simultaneously be used for courses provided by institutions and for individual or collaborative informal learning processes and activities. Personalisation and collaborative processes are important when the aim is to support different learning activities for learners in institutions, employees in in-company-training, visitors to cultural institutions and citizens searching for information. The development of social software offers clear opportunities for moving in this direction.

Recently a project at The State and University Library, Aarhus and Aarhus University on digitalised commercials from cinemas and television has shown that learners require new competencies through working with large amount of digital resources in databases. Learners are able to set up a hypothesis and dig for answers by searching and analysing larger quanta of digital material. They are offered opportunities to study in problem-based and project-oriented ways.

In order to further investigate the potential of using digitalised cultural heritage as a learning resource Aarhus University in collaboration with European partners has submitted an application to The 7<sup>th</sup> Framework Programme on 'digital libraries and content'. Fundamental to the project is the integration of research into the learning potential of digital cultural heritage with that of the capability of Web 2.0 for creating personalised interactive and collaborative learning environments. Museums, galleries and libraries are repositories of huge cultural heritages which when coupled with these learning environments opens up the possibility of digital cultural heritage functioning as an enormous encyclopaedia. In the near future mobile technologies with built-in GPS devices will make information available everywhere as both 'pull' and 'push' services. Questions may be explored and hopefully resolved as they occur to the inquirer. One is standing on the doorstep of a new enlightenment era if these trends can be integrated into an open collaborative learning environment. The project seeks to investigate the pedagogical consequences and possibilities for learning when mobile platforms and ubiquitous computing become dominant for networking.

## 2. VIEWING DIGITAL CULTURAL HERITAGE AS LEARNING RESOURCES

Libraries, museums and galleries are repositories of huge cultural heritage which when made accessible through digitisation and organised in databases become educational resources. The digitisation of the cultural heritage is a powerful resource that is becoming available for national and European identity projects. Digitalised cultural heritage materials become keystones for new learning activities and enhances intercultural understanding by adding a European dimension to education.

Building European identity involves developing a sense of it being over and above national identity but also including it. European identity is not about enforcing cultural homogeneity but about being a European as well as a national citizen. The construction of European identity arises through cultural interchange so that citizens are simultaneously aware of their local, regional, national, and European identities. A fundamental part of this is recognising the unity of European values amidst the appreciation and celebration of cultural diversity. Essential for the creation of intercultural understanding between European citizens is awareness of the different kinds of cultural identification, which range from the local to the European. The advent of digitised cultural heritage materials enables the promotion of this understanding which is vital for both personal relationships within Europe, the creation of a vibrant cross border European labour market, and collaboration within European businesses.

## 3. LEARNING ACTIVITIES ARE THE KEY TO LEARNING

From a classical e-learning content point of view digitalised cultural heritage materials would not be considered as learning objects or educational resources before they have undergone a pedagogical adaptation. However, learning is not within the content. Learning takes place within the learner as a result of what he or she does with the content. Learning resources only become active in the learning process when the learner is doing something useful with them. Therefore the creation of relevant learning activities becomes essential. Successful learning activities mobilise the capacities (present knowledge, cultural heritage, etc.) of learners and establish a dialogue with the new learning resource as the basis for learning. Hereby teachers and tutors are reinstated in a position as responsible for organising the learning process. S/he is choosing relevant learning resources and creating learning activities needed in order to reach defined educational objectives (Bang 2006).

My point is not to diminish achievements of the learning object concept, but to question the concept of learning incorporated through the use of instructional design theory: "Instructional design is based on the empiric assumption that behaviour is predictable, and that educational design, therefore, can occur in isolation from educational execution." (Koper, 2000 p.14), but "(...) a lot of learning does not come from knowledge resources at all, but stems from the activities of learners solving problems, interacting with real devices, interacting in their social and work situation (...) it is the activities of the learners into the learning environment, which are accountable for the learning." (Koper, 2001 p.3).

A dialectic relationship exists between learning activities and learning content, and the basic learning activity on which other activities build, is a dialogue between the learner and the learning material. Therefore any adaptation of learning material to enhance this dialogue become essential, in parallel with creation of new tools for interacting with the learning material and collaboration between peers. Lately OLCOS (Open eLearning Content Observatory Services) has predicted this development in their visionary 'Roadmap 2012':

"The current dominant paradigm of teacher- and subject-centred learning in formal education will have given way to a learner-centred, competency-based paradigm. In particular, learning communities and collaborative approaches will flourish, making use of a new generation of easy-to-use Web-based tools and information services (e.g. Wikis for collaborative work on study projects, Weblogs for sharing ideas and comments, RSS feeders and aggregators for receiving current "real world" information, etc.).

Furthermore, teachers and students will have an ePortfolio to document study results and creative works, reflect upon learning progress, and share resources and experiences with peers.(...)

Open and easy access to e-content repositories of academic and educational institutions, public sector information agencies, libraries, museums and other cultural institutions will allow for making use of information sources as needed to carry out creative projects and study work." (OLCOS, 2007 p.117)

By shifting the focus from learning content to learning activities in the symbiotic relation between the two, educational technologies for collaboration, sharing and knowledge construction become more important than technologies for distribution, dissemination and knowledge transfer. Focus is on content and the ways content is turned into knowledge via the activities of interaction, communication, collaboration, and construction. This process is very dependent on the social and cultural environments in which it is embedded.

The OECD report 'E-Learning. The Partnership Challenge' expressed and documented a clear scepticism toward a 'technology driven' approach to education and learning: "Technology alone does not deliver educational success. It only becomes valuable in education if learners and teachers can do something useful with it." (OECD, 2001 p. 24). And some years later another OECD report 'E-learning in Tertiary Education. Where do we stand?' elaborated on the same problem: "The current immaturity of online learning is demonstrated by low adoption of content management systems (...). ICT has penetrated tertiary education, but has had more impact on administrative services (e.g. admissions, registration, fee payment, purchasing) than on the pedagogic fundamentals of the classroom." (OECD, 2005 p. 14-15). Therefore, the challenge is to create learning options that enhance learning by increasing flexibility, by offering tools for collaboration and by creating options for interaction with large-scale multi-medial learning resources - such as the digitalised cultural heritage - through a series of possible learning activities that relate to the social and cultural environment.

Looking towards the future learning environments should bridge the gap between formal, informal and non-formal learning with a focus on enhancing knowledge acquisition and sharing independently of whether the provider is an educational institution, a museum and library or a mass media. Web 2.0 offers clear opportunities for moving in this direction, but so do analytical tools for annotation and segmentation. Interestingly enough the evaluation of the open educational resources initiative initiated by the Hewlett Foundation 'A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities' points towards the need for an open participatory learning infrastructure (OPLI) to fulfil the ambitions of the open educational resource movement:

"The next phase is to nurture a culture of learning in which both intellectual capital (content) and human capital (talent) spiral upward, together. The conditions now exist, we believe, to consolidate understanding, technology, and incentive from multiple threads of activity into an open participatory learning infrastructure (OPLI).

(...) By open participatory learning infrastructure we mean the institutional practices, technical infrastructure, and social norms that allow a smooth operation of globally distributed, high-quality open learning. We include the word "participatory" to emphasize that the focus is not just on information access, but on the role of technology in supporting the social nature of learning. (...)

This perspective is consistent with collaboratories in science and humanities communities and the social software and the Web 2.0 movement more generally." (Atkins a.o., 2007 p.6)

#### **4. LEARNING WITH DIGITALISED CULTURAL HERITAGE MATERIAL**

In order to illustrate some of the potentials of using digitalised cultural heritage material as a learning resource I will draw attention to a recent project at The State and University Library, Aarhus and Aarhus University on digitalised commercials from the 20th century previously shown in cinemas and television. At the moment the database contains approximately 4000 commercials shown in cinemas from the early 1910's to 1995 (commercials from the last 10 years will be

incorporated in 2008), plus 50.000 commercials shown on Danish TV2 since 1988 - the year commercial television started in Denmark. The material has been digitalised with support from the Danish Research Council for Culture and Communication (the advertising films) and the Ministry of Culture (TV2 commercials, financed by revenue from selling UTMS licenses) as part of a major initiative to preserve and promote the Danish cultural heritage.

The project has had three goals: 1) to collect and preserve old advertising films from cinemas, 2) to explore new research potentials within cultural studies based on digitalised cultural heritage artefacts, and 3) to create an educational resource.

The first goal was a clear library obligation. Traditionally commercials and advertisement films have not been considered part of the culture that ought to be preserved. The understanding of cultural values in common or popular culture is rather new. Therefore, most advertisement films are lost and the ones preserved are in a poor condition. Part of the project was to restore these old films.

The second goal of the project was to explore research potentials in the digitalised cultural heritage and especially the ones related to digitalised audio-visual materials. A group of researcher at Department for Information and Media Studies at Aarhus University has investigated these options and published some of the results in p.o.v. 23, 2007. My own contribution: "Short Narrative Advertising and Cultural Heritage. New Options for Cultural Study Research via Digitalisation" discusses issues as: To what extent does it make sense to view advertising films and TV-ads as part of a Danish cultural heritage? And more specifically: How are advertisements to be analysed as cultural indicators?

To support the research project partners developed in collaboration with Zentrum für Graphische Datenverarbeitung (ZGDV) in Rostock, Germany an annotation and segmentation tool named VIRAT, which makes it possible to separate digital video into segments based on automatic recognition of scenes, to separate digital video into segments defined by the user, to create links between Microsoft Office-documents and segments in digital video, to transfer text from Microsoft Office-documents to the VIRATs annotation window, to regulate showing of digital video (between 0,25 and 2 normal speed) and to show metadata from The State and University Library's collection of commercials. By combining the VIRAT tool and the search facilities of The State and University Library researchers are able to identify and download to his or her own computer the digital commercials he/she wants to investigate further, to view the videos in different speeds, separate them into scenes, annotate notes and comments and circulate these to colleagues, he/she are collaborating with. The annotations may also be stored parallel to the metadata of the commercials for continuously expansion of knowledge related to each commercial. Especially these options for extended search, integration of comments (text) into the audio-visual material and exchange of comments (notes) with colleagues (collaboration) have proven to be an enhancement of the research process.

The third goal 'to create an educational resource' has to some extent been limited by copyright restrictions imposed upon the project. An extract of especially interesting commercials (at the moment 300 advertisement films, but to be supplemented with 5-600 television commercials in 2008) has been made available for schools at a favourable rate. It is not possible to download these videos, only to view them in a streamed version. Consequently, it is not possible to use VIRAT either. Nevertheless, this small collection of commercials offers pupils at schools an opportunity of working with hypothesis building and testing related to cultural changes over the years. At university level within institutions subscribing on access to the database, students have access to explore the full database for exam projects - also including the use of the VIRAT tool.

For all groups - learners in schools and at universities, and in the future hopefully the whole public - this resource of commercials offers a range of topics for further exploration. Obviously the digital commercials may enhance teaching and learning of advertising strategies over a period of 100 years. Furthermore, the material contains sources for tracing cultural developments in the 20<sup>th</sup> century, e.g. how the concept of family, especially the role of women, has changed based on analysis of commercials for food, cooking and laundering. Another option is to investigate the development of

audiovisual language (film and television) in the period. This is just to mention a few of the numerous possibilities.

More important at a general educational level are the competencies that learners require through working with large amount of digital resources in databases. This type of competency is becoming more and more central in the knowledge society. Learners are able - alone or in groups, with or without teacher support - to set up a hypothesis and dig for answers by searching and analysing larger quanta of digital material. They are offered opportunities to study in problem-based and project-oriented ways. Especially, I want to underline the open nature of such a digital learning resource as the Danish commercials. The same material may be used in different learning scenarios and for different groups of learners. The task of the experienced teacher with his or her knowledge of students and curriculum is to set up or outline a frame for relevant learning activities. In order to support the creation of learning activities in relation to large learning resources, teaching experiences from former use of the material could be collected, stored and supplied with relevant pedagogical metadata. These metadata should be dynamic in the sense that users should be able constantly to attach additional metadata related to the use of the resource - the activities. In this way it should be possible to collaborate and explore pedagogic opportunities within the learning resource.

## 5. FURTHER INVESTIGATION OF THE LEARNING POTENTIAL

In order to further investigate the potential of using digitalised cultural heritage as a learning resource Aarhus University in collaboration with Birmingham City University, Fraunhofer Institut für Graphische Datenverarbeitung and AVISIS (Multiple Image Tools GmbH) has submitted an application to The 7<sup>th</sup> Framework Programme on 'digital libraries and content'. Fundamental for this process is an increase in accessibility, which enables digital cultural heritage to become a learning resource. The project will explore the barriers to simultaneously searching across different meta-data formats and multiple databases. Increased access to digital cultural heritage material will enable learners, citizens, and business people seeking cross-cultural understanding to widen their understanding of European culture and its people.

In order to achieve this goal the project will develop a learning environment based on novel technologies - namely Web 2.0 and other service oriented approaches. This will be based on open source software and the creative commons licensing agreement. At the same time the learning environment should promote intercultural exchange by supporting active discussion, collaboration, and transparency among learners. This will be achieved by user-generated content, learners sharing their writings and productions, and through comments and collaborative tagging of content. Dialogue between learners - moving from few to many to many to many communication - will promote intercultural exchange through understanding of how the same ideas are viewed differently in various cultures and expand the learning environment via learner contributions. Furthermore the learning environment will enhance learning by creating flexibility and personalisation through offering new tools for collaboration and generating options for interaction with large-scale multi-media learning resources. The project will deal with ways of overcoming the present restrictions of mass individualisation systems, which essentially deliver information one way instead of being genuinely collaborative.

The learning environment will bridge the gap between formal and informal learning with a focus on enhancing knowledge acquisition and sharing regardless of whether the provider is an educational institution, museum, library, gallery or mass media supplier. The challenge is to create an open learning environment, which can simultaneously be used for courses provided by institutions and for individual informal learning activities. Personalisation will be an essential part of this learning environment when the aim is to support different self organised learning activities for learners in institutions, employees in in-company-training, visitors to cultural institutions, and citizens searching for information. Learners will be able to personalise their learning environment and access information according to their background, intentions, and geographical location.

As the project develops explorations of the pedagogical potential involved in Web 2.0 and databases of digital materials will be further explored in the context of mobile learning - especially the

perspectives of accessibility independent of time and place. It is expected that the project will be able to develop pedagogies for formal and informal learning based on GPS enabled mobile phones.

The outcome of the project may be summaries in the following five headlines:

### **5.1 New formal and informal learning options**

The learning process is becoming increasingly independent of institutions and formal organisations due to the new technologies and as such the scope and potential for self-learning is growing. Social software development offers clear opportunities for moving in this direction. The use of social software among the younger generation points towards building social communities, which are independent of time and place. Fundamental to the project is the integration of research into the learning potential of digital cultural heritage with that of the capability of Web 2.0 for creating personalised interactive and collaborative learning environments. Museums, galleries and libraries are repositories of huge cultural heritages which when coupled with these learning environments opens up the exciting possibility of digital cultural heritage functioning as an enormous encyclopaedia. Such learning environments are ideally suited for facilitating the widespread use of these digitised cultural heritage resources in the collaborative creation of cultural experiences. They can use the power of Web 2.0 technology to bring diverse cultural insights, materials, and experiences together in new ways.

### **5.2 Enlightenment through mobile learning**

The project will provide new research results, which inform and augment the guidelines for developing these environments. Much progress in improving interactive and collaborative learning environments hinges upon an adequate conceptualisation of the learning situation. The pedagogical inquiry into personalised approaches to learning with its emphasis on social constructivism provides a firm research foundation for taking these questions forward. In the near future mobile technologies with built-in GPS devices will make information available everywhere as both 'pull' and 'push' services. Questions may be explored and hopefully resolved as they occur to the inquirer. One is standing on the doorstep of a new enlightenment era if these trends can be integrated into an open collaborative learning environment. The project seeks to investigate the pedagogical consequences and possibilities for learning when mobile platforms and ubiquitous computing become dominant for networking.

### **5.3 Creating learners with new competencies**

From an educational point of view working with large quantities of digital resources in databases will create new types of competencies that are becoming more and more central in the knowledge society. It will meet an important need, as such skills are not currently being taught in schools and universities. The development of such skills will promote the faster and more effective acquisition of knowledge, competences and skills, increased knowledge worker productivity, and more efficient organisational learning processes all of which are essential for increasingly dynamic working environments. Learners will be able - alone or in groups, with or without teacher support - to set up a hypothesis and dig for answers by searching and analysing larger quantities of digital material. They will be offered opportunities to study in problem-based and project-oriented ways. Digital learning resources may be used in different learning scenarios and for diverse groups of learners. The task of the experienced teacher with his or her knowledge of students and curriculum is to set up or outline a frame for relevant learning activities. Shifting the focus to learning activities reinstalls the teacher as an educator with responsibility for organising the learning process as a facilitator. From a classical e-learning content point of view these resources would not be considered as learning objects or educational resources before the material has undergone a pedagogical adaptation. However, in a constructivist concept of learning emphasis shifts from the content itself to the learning activities performed by the learner. Learning takes place within the learner as a result of what is done with the content so new tools for interacting with the learning material and collaboration between peers become essential.

## 5.4 Creating an open adaptable and flexible learning environment

Within the framework the learning environment is primarily focused upon formal and informal learning but through the open standards and continuous development of Web 2.0 (eventually turning into Web 3.0, 4.0, 5.0, ...) the open learning environment is future proofed. The current trend of mass individualisation is supplemented with a possibility of real personalisation by integrating user generated content, user subscriptions to existing content (including tagging), and dialogues between users. An essential contribution to the usability of this learning environment will be made by users having a single authentication procedure.

## 5.5 Creating citizens with European identity

The project will also contribute to a better understanding of European identity through the exploration of the pedagogical issues involved in this and via the integration of European cultural heritage in formal and informal learning processes.

## 6. PERSPECTIVES

Museums, galleries and libraries are repositories of huge cultural heritages which when coupled with the learning environment outlined in this paper opens up the exciting possibility of digital cultural heritage functioning as an enormous encyclopaedia. The widespread use of these resources will lead to the collaborative creation of cultural experiences. Furthermore the exploration of the power of Web 2.0 technology will enhance the understanding of diverse cultural insights, materials and experiences. In a wider perspective this will lead to new approaches to European identity, which combine local, regional, national and European perspectives.

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