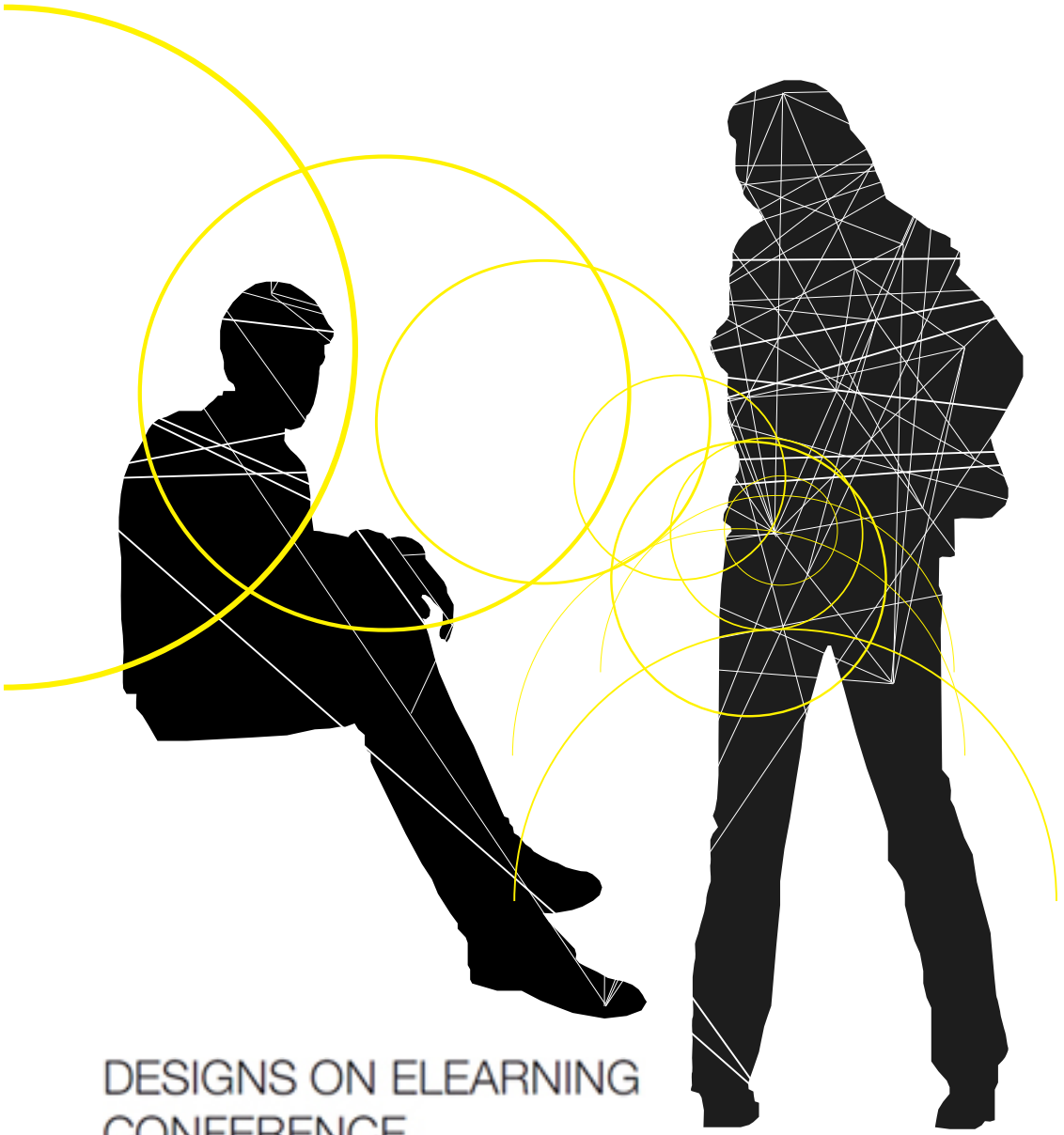
Stefan Sonvilla-Weiss & Owen Kelly (eds.)

future learning spaces



DESIGNS ON ELEARNING
CONFERENCE
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Aalto University

Stefan Sonvilla Weiss & Owen Kelly (eds)

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DoEL 2011: introduction

Stefan Sonvilla-Weiss

The notion of space regains fresh momentum every time anew we interact with the world around us. As mobile devices weave into the fabric of everyday life, one is no longer confined to a specific location, time and place in accessing and interacting with communication technologies. Thereby the interfaces become more adaptable and fluid according to the user's needs for switching seamlessly between augmented, real and virtual information and communication techniques and practices. In educational contexts, however, we are still entangled in the three-dimensional space of Eucledian geometry with which we commonly associate the institutional place of action, yet overlooking at the same the temporal dimension in it. Fragmentation, acceleration, accumulation, synchronicity, ubiquity of information storable and retrievable at different locations at the same time finds its equivalent in mobile and flexible living-, learning- and working arrangements.

The conference topics of investigation delves into these temporal intertwined modes of action between individuals, groups and institutions so as to uncover hitherto unexplored and unarticulated concepts and experiences which would help us to co-develop the creative spaces of the future.

The scope of investigation and participation is conceived as an interdisciplinary dialogue and discussion among students, academics, researchers, decision and policy makers, entrepreneurs and practitioners from various fields.

Specific emphasis is laid on cross-disciplinary dialogue between architects, designers, media artists, educators and entrepreneurs who are passionate about challenging novel media and means of interaction.

The main conference topics deal with the technological, social, cultural and aesthetic dimensions of creative learning spaces and will be discussed in four panels with the following themes:

1. Open experimental space
2. Institutional space
3. Social learning space
4. Networked space

How strongly do social software tools impact on current practices in e-learning in general, and second, what are the implications for the student's mode of interaction (social factor), aesthetics (interface culture) and techniques (interoperability)? Some of my findings derive from actual research on learning ecology and multiple reality constructions, which reciprocally both affect and are affected by multiple facets in socio-economic and culturally encoded concepts of living.

One of these aspects relates to competitiveness in a global job market, which is in fact the driving force behind the concept of lifelong learning and the prevailing motivation of our students to continuously qualify. Interestingly, yet not surprisingly, connectivity has expanded into fluid forms of networking on the basis of immaterial value exchange. Shared spaces where people can communicate, exchange and aggregate information, co-author and co-create areas of common interest, need flexible and adjustable arrangements. Some of the key problems include the limitations of interactions with structured tools; another confinement relates to interface design, communication and learning tools.

As an alternative to conventional tools we want to explore how modular tools can expand functionality; to what extent social tools encourage individual expression and connect learners and content; how synchronous tools can be integrated; and how learner-centered tools encourage learning ecology. The types of tools suggested include Blogs, Wikis, Virtual Worlds, social tools, networking tools, collaborative spaces, and connection-making protocols. But how do these alternatives provide the learner with control of the type of content explored, and how do they explore to effectively meet their learning goals?

In the Open experimental space discussion we want to look at the lessons that can be learned from the creative use of architectural space, and the modes of interaction that can arise within it. We will reflect upon innovative & interactive collaborative learning techniques.

How do social media, augmented spaces and networking tools constitute new forms of blended learning? In the Social learning space panel we will explore connectivism & strategies for learning in mobile spaces.

Can we expect to see smooth technology working in sustainable ways?

In the Networked space discussion we want to discover how is learning affected by the metaverse, ubiquitous computing & the reconceptualisation of cities as dynamic learning spaces?

How does institutional space extend into informal networked space and what would be the role of the university if many of its current services were disaggregated to specialist providers on the web?

At the core of the Institutional spaces discussion is the question what would happen if we share resources across the institutional boundaries and to work together in a spirit

of collaborative research and teaching?

Digital network culture has not only been changing the modes of media production and distribution: it coevally conveys emerging models of cooperation, communication and interaction by accumulating various ideas, talents and capabilities. Hence, the tasks of tomorrow's artists is that of an intermediary, a catalyst between diverse fields of knowledge, ways of thinking, social models and solution strategies. The protagonists of this development, hackers, software artists, media and knowledge designers who are irrespectively showing strong commitment in the face of considerable risk, are opening up new territories in which their role and their scope of action have not yet been fully explored. This alludes to critical inquiry, research and development in socio-political and scientific contexts.

Section 1
Keynote Speakers

Quality Assurance and the Phenomenological Space Design

Mauri Ylä-Kotola

Scientific Summary

When we talk about quality in our everyday lives, we mean success all around. Quality management means controlling and directing quality strategically. It is an approach that has become part of the development of processes in traditional industry as well as knowledge work. In the business world, quality management has seen as a means to achieve economic benefits, lower costs and increase profits.

Clearly, these aims are not directly applicable in the university context. Historically, quality assurance in the universities has focused on the products, scholarly works and services that the institutions produce. Peer review has served as the principal mechanism for gauging the quality of academic work such as staff publications or student theses. Indirect methods for assessing a university's performance include tracking graduates' career advancement. More often than not, however, competent quality assessment has remained the province of historians.

The recent cultural discussion has been dominated by the never-ending debate about the modern and postmodern culture. But can we also define, what is modern and what is postmodern quality assurance philosophy?

It is usual to consider modernism as a continuation of the Enlightenment and postmodernism as a new Romanticism. What connects modernism to the Englightenment is first and foremost universalism; what connects postmodernism to Romanticism is cultural pluralism. Generally speaking, the Englightenment and modernism believe in one reason; whereas Romanticism and postmodernism believe that there is no universally applicable reason, but different belief systems that cannot be compared with uniform criteria. It is also possible to think that in one production process there is only one pattern of indicators for the quality management or that there are different belief systems of quality that cannot be compared with uniform criteria.

According to the Enlightenment, human nature is the same everywhere and every time. It is through rational discussion that people and societies can find the right goals for them as well as the effective ways to reach them. This discussion is made possible by the human ability to use language and think rationally. Reason is an ability on which human relationships are based. It is reason that makes emancipation and progress possible.

Romanticism, on the other hand, is interested in what is special in individuals, groups, peoples, and nations. One cornerstone of Romanticism is nationalism; another one is ex-

pressionism. According to expressionism, genuine expressions of human emotion must take precedence over clinical and one-dimensional scientific rational concept of quality. What Romanticism emphasizes is genuineness as a symbol of quality and human nature instead of artificiality.

The previous characterizations of the Enlightenment and Romanticism can be reasonably well applied to modernism and postmodernism as well. At its purest, modern art was Bauhausian: scientific, ahistorical, and universal. The quality of art means that right combinations of colors and shapes could be determined by the structure of the human sense organ; understanding the principles of human sensomotoric functions made functionalism possible. Using information aesthetics, beauty as an aesthetics quality could be found somewhere between chaos and repetition.

Postmodernism, on the other hand, emphasizes distinction, differences, new tribalism that is created when people join various subcultures and leave them. The quality systems of different groups are equally valuable and cannot be evalued with a uniform criteria.

The modern conception of quality assurance entails a range of procedures, processes and systems that will ensure and improve quality. Quality in this context means adherence to procedures, processes and systems that can be clearly articulated and are appropriately geared to achieving the objectives set. Underpinning this notion of quality is the mindset embodied in technical norms; as Georg Henrik von Wright put it, “If you want A and think that you are in situation B, your most rational course of action is X.” This approach in effect asserts that it is methodical and consistent action which produces quality.

Georg Henrik von Wright’s archetypal technical norm sets out not only the goals of the action but also an analysis of the situation and a specification of the means by which the objectives are achieved. In quality assurance work at many universities, the values of institutions are integrated into the systems of management, which purpose is to produce quality. However, management is not possible without constant analysis of the university in its operating environment. It is a process based on the development of various evaluation measures and indicators and the interpretation of the information they produce.

Following Georg Henrik von Wright, the general goal of metadesign can be said to be the specification of technical norms:

> Our example is: If we want to produce spatial media space services that interest chinese people, we have to use certain methods of expression and production.
>
> In their most general form, technical norms express an objective, A, a belief concerning the state of the world, B, and a means, X:
>
> If you want A and think that you are in situation B, you should do (it would

be reasonable for you to do) X.

If we express the above example in terms of this equation, we obtain the following:

If we want A

If we would like to produce spatial media space services that interest chinese people

and we think that we are in situation B

and we think that certain cultural norms, audiovisual forms of understanding and perception determine whether chinese people are interested in a certain spatial media space service or not,

we should (it would be reasonable for we to) do X

we should use certain means of expression and production.

A technical norm such as this is true if the carrying out of X is truly a means of achieving A in situation B. Technical norms are contingent in that they are binding only on those people who accept the goal expressed in the conditional statement. If we think of the structure of for example media science, term A is media philosophy, which explores the goals and values which serve as our starting points in developing media. Term B is research in spatial media space culture. Actual guidelines (X) are provided by media design (the design of expression) and media education, which rely on terms A and B.

In order to design spatial media space service which is actualized as a particular mental representation, we must recognize what we can accomplish with regard to multimedia and ascertain the values our target audience ascribes to multimedia and the manner in which they perceive it. Thus, media research based on the traditions of humanistic and cultural research is an essential part of, and precondition for, media research in the industrial arts; but it does not encompass the entire discipline. Media design provides guidelines for how to create a spatial media product which the user will perceive in the desired way and it can thus be seen as a precondition for successful MediaSpace-based advertising. We can design two things: the physical spatial media product and the spatial media product as it exists in the user's mind.

In planning a media product in the user's mind, we can postulate a certain ideal user with certain culturally determined forms of audiovisual perception. At the same time, however, we must bear in mind that advertising and popular culture are consciously changing these perceptual habits to render them more receptive to new media products. In this connection, one might mention Andy Warhol, who not only created art but also changed the parameters according to which we perceive it. Media Space education is the branch of metadesign that specifies the means used in situation B to create the models and schemata that guide our perception of media products. For example, works of art

that fail to fit our established patterns of thought might change the way in which we perceive audiovisual material and spaces. Media design (the design of such products), guided by the appropriate scientific foundation, might provide media education with a useful tool for the phenomenologiacal design.

The physical space created by the artist is more than a starting point for the mental space created by the perceiver; it has the potential to change the way the perceiver forms such spaces.

In this case, our example takes on the following form:

> If we want to produce spatial media space services that interest chinese people, we have to use the expressive, productive and technological methods that correspond to the present chinese expectations of what constitutes an interesting media space service; or we have to use the expressive, productive and technological methods which yield a media product that, in being used, will change the norms that govern what chinese people consider interesting.

Thus, a media product as a mental representation is the outcome of two parallel processes of design: phyciacal design and phenomenological design.

One interesting example of two different quality assurance policies is in the area of aethetics quality: is beauty universal quality? According to Romanticism, Russian beauty is different from German; according to postmodernism, beauty in the world of Miami Vice is determined by different rules than in the world of French art film.

Let's look at one enlightened attempt to find the universal basis of beauty. Professor of philosophy and mathematician at the University of Helsinki Ilkka Niiniluoto has applied the statistical concept of information to art: this is based on the fact that the elements of the language of art and their combinations appear in certain fields of culture and artistic styles relatively frequently. Thus, their 'suprise value' in relation to the frequency of appearance can be calculated. According to Niiniluoto, a similar idea is the basis of a construct presented by G. Elfving in 1965. This construct shows how certain stochastic processes can be used to make synthetic art.

The starting point is the beauty of sentences. A sentence has aesthetic value if the work of art is not too chaotic – as is the sentence "jkzao awqia rcexr lumsz" which is informatively effective and has high entropy; nor too standard – as the sentence "kkkkkkkkkkkkkkkk" which is an example of high redundance; but there is the right amount of redundance, as in the Finnish sentence "käki kukkuu kaunihisti" (literally, "A cuckoo cuckoos beautifully").

This method can be generalized for two-dimensional images that are constituted of white and black squares. If the squares are colored according to a probable mechanism in a way that the correlation between adjoining squares is strong, but not too strong, we can

achieve aesthetically interesting entities. It has been claimed that this theory can be used to describe visual beauty in more general terms as well.

As such, Niiniluoto's theory cannot be accepted as the theory of beauty. Since perception is always directed and targeted, there are no absolute line formations that we see; rather, we see a structural entity that our perception constructs. For example, whether we perceive the dimension of depth has a radical influence on the phenomenon – I am referring to the well-known fact that in certain African cultures perception is two-dimensional. In fact, the physical image of the world is a construction created by our brains. This has been studied by Göte Nyman, professor of psychology at the University of Helsinki. This is how he describes his scientific progress: "One could almost say that I've proceeded as if along the optic nerve. It started with the problematics associated with the optic image. However, gradually I started to realize that it is not only an image that is transmitted in the process, since the neural web totally transforms the image already on the retina. One has had to think that this physical depiction of the world is, in fact, our personal picture created by ourselves". From that perspective romantic quality assurance policy can be more relevant than modern one.

Critical and emancipatory are complex terms that can be understood in a number of ways. A critical approach is crucial to the university's ability to produce new knowledge. In *The Egyptian*, Mika Waltari described medicine in Ancient Egypt as the transfer of tradition and ritual from one generation to the next. In contrast, the distinctive feature of modern science is that it is self-correcting and that it constantly challenges received knowledge. In this vein, quality assurance work requires ongoing evaluation and development of the procedures used in that work and a readiness to modify them. The innovation quality policy of university cannot be a fossilised, unassailable authority, but must provide a catalyst for debate at the institution on how quality assurance mechanisms can be improved.

Emancipatory knowledge is knowledge that enables us to challenge what we have considered to be self-evident and the truths we have held dearest. Jürgen Habermas posited three interests for science, the technical, the hermeneutic and the emancipatory. Science can solve problems and transfer knowledge and skills from one generation to the next, but it can also challenge social truths. As a core value of the university, this last interest translates into the emancipation of and guaranteeing of equality for minorities. This is an aspiration that should be embraced by every member of the community, mindful as we are, in Julia Kristeva's words, that "the other is within us."

The prevailing notion in the philosophy of science is that adherence to the scientific method ensures quality. Hans Reichenbach posited that scientific activity is divided into discovery and justification. Discovery as an activity does not fulfil the same conditions for science that are observed in the process of justification.

Creativity is a challenge to the quality assurance system. The relationship between the quality of a regular process and the outcome of that process differ, for example, if one

compares the work of a computer or an artist. Quality output in the case of a computer is traditionally defined in terms of mathematical algorithms and flowcharts, whereas quality achieved by an artist or researcher is a process that is difficult to standardise and describe. For a computer, or a production manager at a paper mill, quality means the flawless execution of repetitive operations in keeping with the relevant quality assurance system. The core process of a paper mill is far more conducive to description than creative research work or artistic work.

The place of peer production in the next long wave: opportunities for Romania

By Michel Bauwens, http://p2pfoundation.net

This essay consists of three parts. The first part is a general presentation of the nature of the present crisis, and how we can possibly/realistically expect a renewed period of growth. The second part explains the role of peer to peer dynamics in this re-orientation of our political economy, while the third part explains its political implications, and the possibilities for a phase transition towards a post-capitalist society, centered around peer production.

PART ONE: UNDERSTANDING THE PRESENT CRISIS

The Nature of the Present Crisis

My understanding of the present crisis is inspired by the works on long waves by Kondratieff, and how it has been updated in particular by Carlota Perez, in her work: Technological Revolutions and Financial Capital. This work has recently been updated and re-interpreted by Badalian and Krovorotov.

The essential understanding of these approaches that economic history can be understood as a series of long waves of technological development, embedded in a particular supportive institutional framework. These long waves inevitably end up in crisis, in a Sudden System Shock, a sign that the old framework is no longer operative.

Why is that so?

These waves have a certain internal logic. They start with a period of gestation, in which the new technology is established, creating enthusiasm and bubbles, but cannot really emerge because the institutional framework still reflects older realities. This is followed by a period of maturation, marked by institutional adaptation, massive investment by the state, and productive investment by business, leading to a growth cycle. Finally, a period of decline and saturation, in which the state retreats, business investments become parasitic, leading to a contraction cycle with speculative financial bubbles, which ends in a Sudden Systemic Shock (1797, 1847, 1893, 1929 or 2008).

To understand the current period in this framework, some dates are important:

- 1929 as the Sudden Systemic Shock ending the previous long wave
- 1929-1945: gestation period of the new system
- 1945-1973: maturation period, the high days of the Fordist system based on cheap domestic oil in the US
- 1973: inflationary oil shock, leading to outward globalization but also speculative investment and the downward phase ending in the

- Sudden Systemic Shock of 2008

The important thing is this, every long wave of appr. 50-60 years has been based on a combination of different structural developments in production and distribution. Whilst modern economics is totally focusing on the monetary side of things, the crisis is only explainable if we also look on the physical side.

So each long wave cycle was an interplay of

1) a new form of energy (f.e. the UK domination was based on coal, the US domination was based on oil); in the beginning of a new wave, the newly dominant power has particular privileged access to a cheap domestic supply, which funds its dominance; when that cheap supply dries up, a (inflationary) crisis ensues, which forces that power outwards, to look for new supplies in the rest of the world. This results in both dynamic globalization, but also in the awakening of a new periphery. Because the last phase is linked to globalization and the control of external energy supplies, it is also strongly correlated to military overstretch, which is a crucial factor in weakening the dominance of the main player.

2) some radical technological innovations (no more than 3 according to the authors); The 3 last ones: 1830: Steam and railways • 1870: Heavy engineering • 1920: Automotive and mass production

3) a new 'hyper-productive' way to 'exploit the territory'; This is where land use comes in. For the last period, though the overall benefits are contested industrial agriculture and the 'Green Revolution' did lead to a jump in agricultural production capacity. The last 'parasitic' phase of a long wave cycle is then also marked by hyper-exploitation of existing land base. The example of the dust bowl in the American mid-West is an example. This accumulation of problems in turn lead to the search for new methods of land-use that can be used to develop new types of land for the next up cycle.

4) an appropriate financial system: i.e. the new type of public companies, and New Deal type investments (such as the Marshall Plan) in the growth cycle phase, morphing into the parasitic investments of casino capitalism in the second phase. Importantly, Badalian and Krovorotov note that each new financial system was more socialized than the previous one, for example the joint stock company allowing a multitude of shareholders to invest.

In the growth phase, the newly expanded financial means fund the large infrastructural investments needed to create the new integrated accumulation engine; in the declining phase, the financial system overshoots the capabilities of the productive economy, becomes separated from it, and starts investing in parasitic investments.

5) a particular social contract. Here also, we can see waves of more intensive 'socialization'. For example, the Fordist social contract created the mass consumer in the first phase, based on social peace with labour, while in the second parasitic phase, the part going to worker's was drastically reduced, but replaced by a systemic indebtedness of consumers, leading to the current Sudden System Shock.

6) A particular way of conceiving of the organization of human institutions, in particular the conception of the types of businesses and the management-workers relations, but also internally, the types of collaboration amongst employees and between employees and management.

6) As we mentioned above, each wave has been dominated by a particular great political power as well, and in the second phase of expansion, a new periphery is awakened, creating the seeds for a future wave of dominance by new players. For example, the U.S. was peripheral for the long wave occupied by the British Empire, but became dominant in the next phase.

Roots of the current crisis

It is important not to forget the essential characteristics of the contraction cycle: what enables growth in a first phase, becomes an unproductive burden in the second, declining phase of the wave.

If we review the 6 factors, it's easy to see where the problems are:

1) The era of abundant fossil fuels is coming to an end; after Peak Oil, oil is bound to become more and more expensive, making oil-based production uneconomical. Nuclear Power is no real replacement for this, as its own raw material is equally subject to depletion, and it poses many long-term problems through its waste products.

2) The era of mass production, based on the car, requires a too heavy environmental burden to be sustainable, and is/was heavily dependent on cheap energy for transportation.

3) Industrial agriculture destroys the very soils that it uses and is mainly based on depletable petroleum-derivates.

4) The financial system is broken and the $10 trillion bailout drains productive investments towards unproductive parasitic investments.

5) The Fordist social contract, broken in the 80s, has led to the increased weakening of the Western middle class and a generalized precarity, which no longer functions after Sudden System Shock.

6) The old dominant power, the U.S. can no longer afford its dominance, and has awakened the periphery, most likely East Asia. The powers

that see the opportunity to compete are looking for new societal structures that help them emerge. They cannot rely on the strategies of the dying long wave to achieve these goals, but must invent new ones.

Seeds of the new

What are the innovations that we can expect if a new wave is too occur?

1) The technology for renewable energy has been developed, but needs at least $150b annual investments in the U.S. alone, in order to become economical. A Green New Deal would jumpstart the new energy era. The wasteful heavy energy usage of the fossil fuel era will need to be replaced by smart precision-based energy usage. Solar energy will probably be the backbone of renewables but can be supplemented by other forms.

2) The era of mass production is ready to be replaced by more local production in small series, based on developments such as flexible and rapid prototyping based manufacturing, mass customization, personal fabrication and additive fabrication, multi-purpose machinery. This flexible system of manufacturing is faster, cheaper, more adaptive, more compatible with solar and renewable energy, can only thrive by deepening participative engagement, thus requiring the re-awakening of production intelligence and personal initiative that were discouraged by the various forms of the industrial system, including the systems based on central planning.

3) Post-industrial organic agriculture has already proven more productive than destructive industrial agriculture, but needs to be generalized; land use needs to be re-expanded within cities where vertical agriculture can be developed more intensively. This form of agriculture uses diversity as its backbone and works with the most sophisticated feedback cycles of nature. It saves also human labour time.

4) The seeds of the new financial system, based on increased socialization towards civil society, have been developed in the last few decades: 1) sovereign wealth funds re-insert the public good in investment decisions; 2) Islamic banking and similar mechanisms avoids the hyper-leveraging that destroyed the Wall Street system; 3) microfinance broadens entrepreneurship and financing to the 'base of the pyramid'; 4) crowdfunding mechanisms, social lending and various credit commons approaches expand the availability of credit; 5) flow money approaches through a circulation charge to discourage parasitic investments

5) The periphery of newly emergent countries has been awakened and will in all likelihood lead to a dominance of the East-Asian region. However, opportunities for other emergent players are still open, providing

they find the appropriate local integration of the productive resources of the new long wave. In this context, we can see the emerging success of Brazil, while Russia has its enormous landmass as immense and under-exploited productive resource.

6) Social media and the internet, now used primarily by civil society and networked individuals, will profoundly change the nature of businesses and other human organizations. Business and work organization needs to go to a profound redesign process to incorporate the hyperproductive benefits of social media.

Peer to peer and the new social contract

A new long phase has been historically associated with an upsurge of the role of the state and the public sector, which alone can undertake the necessary investments which private investment cannot take up in the early phases.

However, we need to be aware of one of the fundamental characteristics of the new period, which is a revival of the role of civil society. The internet is enabling the self-aggregation of civil society forces in the creation of common value, i.e. through peer production. Global communities have shown themselves capable to be hyper-productive in the creation of complex knowledge products, free and open source software, and increasingly, open design associated with distributed manufacturing.

This means that a hybrid form of production has emerged that combines the existence of global self-managed open design communities, for-benefit associations in the form of Foundations which manage the infrastructure of cooperation, and an ecology of associated businesses which benefit and contribute from this commons-based peer production.

These companies, which enable and empower the social production of value, have become the seeds for the dominant companies of the future (Google, eBay, etc...). Companies will need to open up to co-design and co-creation, while the distribution (miniaturization) of the means of physical production, liberates the possibilities for smaller more localized production units to play more essential roles. We believe that the role of solely profit driven multinational companies, without any roots in local communities, is reaching its historical end, and will be replaced increasingly by new models of entities combining profit with the realization of social and public goods. Socially-conscious investment, sovereign wealth funds, micro-finance, social entrepreneurship, fair trade and the emergence of for-benefit entities point to this new institutional future of entrepreneurship. For the state form, this means morphing from the welfare or neoliberal state models, to that of the Partner State, which enables and empowers social production.

The new social contract therefore will mean:

1) Expanding entrepreneurship to civil society and the base of the pyramid

2) New institutions that do well by doing good

3) Social financing mechanisms based on peer to peer aggregation

4) Mechanisms that sustain social innovation (co-design, co-creation) and peer production by civil society

5) Participatory businesses and other human organizations

6) Focus on more localized precision-based physical production in small series, but linked to global open design communities

The new long wave that we are hypothesizing is of course speculative, and needs some caveats.

First of all, it cannot occur without a long period of disruption and adaptation, also needed for the deleveraging of debt of the previous period.

Second, though long waves have structurally occurred in the last 2 centuries, the severe crises related to the depletion of fossil fuels, but also the impact of climate change, could possibly derail such a scenario.

It may also be that, as the current infinite growth system is incompatible with the survival of the biosphere, that these cyclic tendencies may be overturned and interrupted by a more fundamental crises, involving the very survival of capitalism.

Nevertheless, I think that there is a real possibility of a next long wave, based on a new social contract, where netarchical capitalists and peer producing communities will play a larger role. This long wave may likely be interrupted half-way.

What we deem likely is the following: 1) a period of deleveraging and restructuration; 2) a new upturn cycle of the new wave.

However, it is when the upturn hits the first halfway crisis of a Kondratieff Wave, in the context of deepening resource and climate change related crises and challenges, that the crisis of the present system will become systemic, and open up the possibility of a further phase transition, to a form of post-capitalism which is compatible with the survival of the biosphere.

The new modality that has been emerging before the crisis as an emergent new social, political and economic practice is the peer to peer dynamic; it is at present an emergent phenomenom. We believe that its uptake will speed up during the deleveraging and adaptation crises, in order to become a new part of the new social contract, during the new upturn of the Kondratieff cycle. At the end of this half-cycle, when peer to peer may achieve some form of parity, the systemic crises may then lead to the new system becoming the dominant meta-system, while the market system may be the new subsystem integrated in the new system.

With this context set, we can now explain the importance of the peer to peer dynamic

itself.

PART TWO: THE ECONOMICS OF P2P

General introduction

Peer to peer social processes are bottom-up processes whereby agents in a distributed network can freely engage in common pursuits, without external coercion, i.e. permissionlessly undertake actions and relations. This requires not just 'decentralized' systems, but 'distributed' systems, through which individuals can cooperate. Distributed networks do have constraints, forms of internal coercion, that are the conditions for the group to operate, and they may be embedded in the technical infrastructure, the social norms, or legal rules. Despite these caveats, we have here a remarkable social dynamic, which is based both on voluntary participation in the creation of common goods, which are made universally available to all.

Peer to peer processes are emerging in literally every cranny of social life, and have been extensively documentation in the 9,000+ pages of documentation at the Foundation for Peer to Peer Alternatives, and many other places on the Web.

P2P social processes more precisely engender:

> 1) peer production: wherever a group of peers decided to engage in the production of a common resource
>
> 2) peer governance: the means they choose to govern themselves while they engage in such pursuit
>
> 3) peer property: the institutional and legal framework they choose to guard against the private appropriation of this common work; this usually takes the form of non-exclusionary forms of universal common property, as defined through the General Public License, some forms of the Creative Commons licenses, or similar derivatives.

Peer governance combines the free self-aggregation between individual skills and universally broadcast tasks, processes for communal validation of excellence within the broader pool of input, and defense mechanisms against private appropriation and sabotage. Peer governance differs from hierarchical allocation of resources, from allocation through the market, and even from democracy, as these are all mechanisms for dealing with scarce resources. Peer governance essentially aims, and often succeeds, in making sure that no formal 'representative group' can take decisions separate from the community of peer producers.

These new property forms have at least 3 characteristics:

1) they are aimed against the private appropriation of the commonly created value

2) they are aimed at creating the widest possible usage, i.e. they are universal common property regimes

3) they keep the sovereignity with the individual

The third aspect is why peer property fundamentally differs both from private property and collective property.

Private property is individual but is exclusionary, it says, what is mine is not yours.

But state, that is collective property, is also exclusionary, but in another sense: it says, it is ours, but it means that you no longer have the sovereignity. It's from us, regulated by a bureaucracy or representative democracy, but it is not really yours. The collective has taken over from the individual, and more often than not, coercion is involved.

But the General Public License, or the Creative Commons licences are different. Common property is not collective property.

Using them, the individual gets full attribution, i.e. the recognition of his personal property. You are freely sharing your sovereignity with others. This is especially clear in the Creative Commons licensing schemes, where the individual gets a whole gamut of options for sharing. You remain fully in control, i.e. "sovereign", and there is no coercion involved.

It is important to note that peer production is a form of "generalized", on non-reciprocal, exchange. It is not a gift economy, based on direct exchange or obligation. So peer production is not to be equated by cooperative production for the market: participation has to be voluntary, there is no direct reward (but many indirect rewards) in the form of monetary compensation. The process itself is participative. And the outcome is similarly free, in the sense that anyone can access and use the common resource. In reality, most peer production projects are intertwined with a smaller core of people who may get paid, and use finances to create an infrastructure so that the peer production may occur.

If we look at peer production as a mode of production, as a process involving a input, 'processing', and output phase, then we can say that it requires the following:

- Open and free raw material that can be used permissionlessly. Thus, peer production either requires the creation of such open and free raw material by the producers themselves, or materials that are in the public domain or in a commons format already
- The process is participatory with a design that is geared towards inclusion and a posteriori validation, not exclusion through a priori filtering of the participants
- The output is universally available and therefore, uses peer property formats or in other words: a Commons

As the Commons-oriented output creates a new layer of open and free input for further transformation and processing, we have here the requirements for social reproduction of the system, called the Circulation of the Common by Nick White-Dyerford.

Looking at these three inter-related paradigms of open and free, participation, and the Commons, we can then easily understand while movements striving for these conditions and social practices, are arising in almost every single field of human activity.

The conditions for peer production to emerge are essentially: abundance and distribution. Abundance refers to the abundance of intellect or surplus creativity, to the capacity to own means of production with similar excess capacity. Distribution is the accessibility of such abundant resources in fine-grained implements, what Yochai Benkler has called modularity or granularity. Again we could talk about the distribution of intellect, of the production infrastructure, of financial capital.

It is important to distinguish two spheres. In one sphere, our digitally-enabled cooperation, reproduction of non-rival knowledge goods, such as software, content, open designs, takes place at marginal costs, and there is only no loss by sharing, but actually a gain, through network effects. Such free cooperation can only be hindered 'artificially', through either legal means (intellectual property regimes) or through technical restrictions such as Digital Rights Management, which essentially hinder the social innovation that can take place. In this sphere, a non-reciprocal mode of production becomes dominant, since resources are not rival, and you're not losing, but gaining, through giving. In the sphere of material production, where the costs of production are higher, and we have rival goods, we still require regimes of exchange, or regimes of reciprocity. Notice that in a sphere of virtual abundance, where copying is trivial, there is no tension between supply and demand, and hence no market.

Post-capitalist aspects of peer to peer

Peer production, though embedded in the current political economy and essential for the survival of the cognitive forms of capitalism, is therefore essentially post-capitalist. Essentially because it is outside wage dependency, outside the control of a corporate hierarchy, and does not allocate resources according to any pricing or market mechanism.

Similarly, peer governance could be said to be post-democratic, because it is a form of governance that does not rely on representation, but where participants directly co-decide; and because it is not limited to the political field, but can be used in any social field. Peer governance is non-representational, and this is essentially so because what the networked communication affords us, is the global coordination of small groups, and therefore, the peer to peer logic of small groups can operate on a global scope. Hierarchies, the market, and even representative democracy, are all but means to allocate scarce resources, and do not apply in the context where abundant resources are allocate directly through the social process of cooperation. However, since the pure peer to peer logic only fully functions in the sphere of abundance, it will always have to insert itself

in the forms that are responsible for the allocation of resources in the sphere of material scarcity. Peer governance based leadership seems a combination of invitational leadership, i.e. the capacity to inspire voluntary cooperation, and a posteriori arbitrage based on the reputational capital thus obtained. However, the process of production itself is an emergent property of the cooperating networks.

Finally, peer property is a post-capitalist form of property because it is non-exclusionary, and it creates a commons with marginal reproduction costs. There are two main forms of peer property. One is based on the individual sharing of creative expression, and is dominated by the Creative Commons option which allows an individual to determine the level of sharing. The other is applied to commons-based peer production, and takes the form of the General Public License or its derivatives or alternatives, and requires that any change to the common, also belongs to the common.

The hyper-productive nature of peer to peer

Pre-capitalist class societies are based on coercive extraction of surplus value and hierarchical allocation of resources. Capitalism is based on the part real and part fictional process of equal exchange of value. In other words, we can say that coercive societies are based on the extrinsic motivation of fear, while capitalism is based on the extrinsic motivation of self-interest.

Peer production structurally eliminates extrinsic motivation and replaces it with intrinsic motivation, or in other words passion. It is psychologically the most potent and productive form of human motivation. In addition, the market only allows, at best, for win-win scenarios of mutual interest, but is structurally designed to ignore externalities. Corporate firms can only strive for relative quality in a competitive environment, but peer producing communities strive structurally for absolute quality. As an object-oriented sociality based on the construction of universally available common value, peer production inherently strives for positive externalities, and lacks much of the motivation to create negative externalities for the sake of profit.

The combination of all these characteristics create a hyper-productive mode of production, and a asymmetrical competition with pure for-profit firms relaying on wage labour and closed intellectual property.

This allows us to formulate the bold hypothesis of the Law of asymmetrical competition, which states that:

- Any for-profit company based on closed IP, faced with the competition of a peer producing community, a for-benefit association managing the infrastructure of cooperation, and an ecology of businesses based on a commons, will lose that competitive race.

(This hypothesis would explain the gains of Linux over Microsoft, the rise of Wiki-

pedia as compared to Britannica, as being models for many other examples of asymmetrical completion.)

An entity based on innovation-impeding intellectual property, appropriation of common social value which discourages free contributions, and striving for relative quality (hence consciously substandard products), cannot in the long run survive the challenge of an open competition based on peer production.

However there is an important corollary to this first law, which explains the necessity of hybrid forms, and why peer production can be embedded within an overall capitalist context.

The corollary law is this:

- Any peer production community, which creates a sustainable management for its infrastructure of cooperation and an ecology of businesses which can fund it, will be more competitive than a community which fails to do so.

Pure non-reciprocal production can only occur within a sphere of relative abundance, charactherized by the free aggregation of human brains, ownership or easy access to computers, and socialized access to the networks, such as the internet. However, if peer production is collectively sustainable as long as it can maintain a similar level of volunteerism (offsetting departures with newcomers), it is not so for the individuals concerned. In addition it also requires a additional infrastructure of cooperation, which may have to operate on top of the internet. For example: it may need costly servers in case of success. Peer production cannot therefore fully escape the monetary sphere nor its requirements, demanding hybrid formats.

We will detail this below but in short, we can observe that successful peer projects combine:

1. The freely self-aggregating community

2. A for-benefit association, usually in the form of a nonprofit Foundation, which funds and manages the infrastructure of cooperation

3. An ecology of businesses that practice benefit-sharing, returning part of the profit obtained from selling added value to the market, back to the commons on which their value-creation is based. Such businesses therefore fund the infrastructure of cooperation, hire many of the participants, and thereby maintain the viability and sustainability of their respective Commons

Adaptation of cognitive capitalism to peer to peer

So far, empirical evidence suggests three emerging forms of adaption between the sphere of peer to peer cooperation, and the institutional and market fields.

- The sphere of individual sharing, think YouTube, where sharers have relatively weak links to each other, creates the Web 2.0 business model. In this model, an ethical economy of sharing, co-exists with proprietary platforms which enable and empower such sharing, in exchange for the selling of the aggregated attention
- The sphere of commons-oriented peer production, based on stronger links between cooperators, think Linux or Wikipedia, usually combines a self-governing community, with for-benefit institutions (Apache Foundation, Wikimedia Foundation, etc...), which manage the infrastructure of collaboration, and a ecology of businesses which create scarcities around the commons, and in return support the commons from which they derive their value.
- Finally, crowdsourcing occurs when it is the institutions themselves which attempt to create a framework, where participation can be integrated in their value chain, and this can take a wide variety of forms. This is generally the field of co-creation.

There is a mutual dependence of peer production and the market. Peer production is based on the achievements and surplus of the existing market-dominated society, and on the income that can be generated through participation in the market; on the other hand, market players are increasingly dependent and profiting from social innovation.

Because of the law of asymmetrical competition, i.e. the hyperproductive nature of peer production, corporations are driven to adapt substantially to the new practices and new players emerge that are based on an alliance with peer production. The companies that do so are more competitive than those who do not, creating a new sector of 'netarchical capitalism' which empowers and enables social innovation and peer production to occur.

Corporations have a dual role in this, because of their contradictory nature. They have to sustain cooperation and sharing, i.e. the openness that creates value, but also have to enclose part of the value, as they are competing with others in a scarcity-based marketplace.

We must note that monetary value that is being realized by the capital players, is – in many if not most of the cases, not of the same order as the value created by the social innovation processes. The user-producers-participants are creating direct use value, videos in YouTube, knowledge and software in the case of commons-oriented projects. This use value is put in common pool, freely usable, and therefore, does not consist of scarce products for which pricing can be demanded. The sharing platforms live from selling the derivative attention created, not the use value itself. In the commons model, the abundant commons can also not be directly marketed, without the creation of additional 'scarcities'.

What does all of this mean for the market sphere?

It is now possible to create all kinds of use value without, or with only a minimal, or with only a posteriori, intervention of capital. We are dealing with post-monetary, post-capitalist modes of value creation and exchange, that are both immanent, i.e. embedded, to the market, but also transcendent to it, i.e. operating outside its boundaries. Capital is increasingly dependent, and profiting in all kinds of ways, from the positive externalities of such social innovation.

So the challenge can be described as follows: 1) we have a process of social innovation which creates mostly non-monetary value for the participants; 2) we may have an increasingly huge gap between the possibility of creating post-monetary value, and the derivative exchange values that are realized by enterprise; 3) the participants engaged in such passionate production and innovation, mostly cannot find in such processes an answer to their own sustainability.

Hence, the impossibility to realize more than just a small partial monetary value, from the point of view of most commercial players. Increasing precarity for the participants of social innovation. In other words, the current market model does not have a reverse process of redistribution for the value that is being created.

This might of course be a temporary crisis, but we do not believe it is. The reason is that the market can only indirectly and partially provide monetary compensation for processes which are not motivated by such compensation. What we need therefore are more general redistributive processes that allow society and the market to give back part of the value that is being so created.

One possibility is the further development of transitional labour market measures (protect the worker, not the job), which recognize the flexibility and mobility of contemporary careers. But this needs an important add-on development: the realization that contemporary workers are moving not just from job to job, but also from jobs to non-jobs, and that in fact, what is most useful and meaningful for them (and the market, and society) are not the paid jobs for the market, but the episodes of passionate production. It seems to me therefore that a more general measure, not linked to the job, but conceived as a repayment for, and enabler of, social innovation, is needed. The name of that general measure is most probably some form of basic income.

Likely expansion of peer production principles to material production

Peer production naturally occurs in the sphere of immaterial production. In this sphere, the access to distributed resources is relatively easy. Large sections of the population in the Western countries are educated, and can have a computer at their disposal. And the costs of reproduction are marginal.

The expansion of peer production is dependent on cultural/legal conditions. It requires open and free raw cultural material to use; participative structures to process it;

and commons-based property forms to protect the results from private appropriation. Hence is a circulation of the common obtained (the concept is from Nick Dyer-Whiteford), through which peer production virally expands.

However, peer production is not limited to the sphere of immaterial production.

First of all, any physical production process, needs to be immaterially designed, and open design is not fundamentally different, though it is more complex, that collaborative knowledge or free software production. So, peer production can work for the design phase of physical production, provided a good infrastructure is available for such co-design.

Physical resources can be shared, if they are available in a distributed format. For example: computers and their files and processing power. Cars can be pooled. Money can be pooled as in the P2P financial exchanges such as Zopa or through mutual credit systems. Wealth acknowledgement procedures can be the basis of the creation of complementary currencies.

Rapid tooling and prototyping, desktop manufacturing, personal fabricators and 3D printers, multi-purpose machinery and other similar developments may and will lower the threshold of participation, creating more modularity and granularity in new fields. In fact, we may observe that the same tendency to miniaturization, which led to the networked computer, is taking place in the domain of physical machinery. Given the decrease in the cost of physical capital, it becomes easy to imagine the combination of open design communities, with cooperative forms of relocalized physical production.

Such expansion is not just a natural extension of technical evolution, but has structural and therefore political impediments. The centralized capital formats of contemporary neoliberal anti-markets obviously impede such expansion. But even with such constraints, the scope for the expansion of peer production is significant.

Again, we will make the following caveat. In the immaterial sphere, non-reciprocal peer production is likely to become dominant. In the field of scarcity, we will see the rise of peer-informed modes of production. This means that markets forms are starting to change, changing from a logic of pure capitalism (making commodities for exchange, so as to increase capital), to logics where the logic of exchange is subsumed to the logic of partnership. Think about fair trade (a market subjected to peer arbitrage), social entrepreneurship (profit used to sustain social goals), base of the pyramid inclusional capitalism, and the many political-social movements that aim to divorce market forms, from the infinite growth logic of capitalism, such as the natural capitalism movement in the U.S.

In the last two-three years, we have witnessed the renewed emergence and rapid growth of craft communities, a maker movement, distributed desktop manufacturing through commercial platforms, and a free and open hardware movement. Open hardware is growing very fast, with companies such as Arduino and Buglabs providing living exemplars and role models, and are inventing their own platforms and infrastructures

such as the Open Source Hardware Bank.

The latter is particularly significant as it shows that open hardware producing communities, such as the ones around the Arduino electronic circuit boards, are creating their own business ecologies.

They are combining the existing triarchical commons model (community, foundation, business), with a solution to the cost recovery problem typical for physical production. Because of this, they are emerging as viable alternatives to the traditional corporate models, and thanks to the inherent hyperproductivity we have argued above, slated to play an increasingly dominant role.

To prosper, and expand beyond its current confines in the sphere of immaterial production, more distributed infrastructures will be necessary, complementing the already existing communication infrastructures:

- Distributed energy: this requires a move away from centralized energy production based on depletable fossil fuels, and towards a home and neighborhood based infrastructure producing renewable energy
- Distributed and multiple currency systems: meta-currency platforms will allow local and virtual (affinity-based) communities to produce exchange mechanisms that are not based on compound interst and fractional reserve banking and can both promote specialized in-community exchange, protect from globalized dislocation, and create an alternative infrastructure of inter-community and inter-individual exchange.
- Open and distributed manufacturing: distributed capital goods with radically lower thresholds such as the ones being developed today, need to be reconfigured and integrated in a vision of relocalized production, in the context of a global cooperation with open design communities

PART THREE: THE POLITICS OF P2P

P2P theory as the emancipatory possibility of the age

Our current political economy is based on a fundamental mistake. It is based on the assumption that natural resources are unlimited, and that it is an endless sink. And it creates artificial scarcity for potentially abundant cultural resources. This combination of quasi-abundance and quasi-scarcity destroys the biosphere and hampers the expansion of social innovation and a free culture.

In a P2P-based society, this situation is reversed: the limits of natural resources are recognized, and the abundance of immaterial resources becomes the core operating principle.

The vision of P2P theory is the following:

1) the core intellectual, cultural and spiritual value will be produced through

non-reciprocal peer production;

2) it is surrounded by a reformed, peer-inspired, sphere of material exchange;

3) it is globally managed by a peer-inspired and reformed state and governance system, a "partner state which enables and empowers the social production of value".

Because of these characteristics, peer to peer can be said to be the core logic of the successor civilization, and is a answer and solution to the structural crisis of contemporary capitalism.

Indeed, because an infinite growth system is a logic and physical impossibility with a limited natural environment, the current world system is facing a structural crisis for its extensive growth. Currently consuming resources at the rate of 'two planets', it would need four planets if countries like China and India would obtain equity with the current Western levels of consumption. Because of the ecological and resource crisis that this causes, the system is ultimately limited in its extensive expansion.

However, its dream for intensive development in the immaterial sphere is equally blocked, since the sphere of abundance and direct social production of value through peer production, creates an exponential growth in use value, but only say a linear growth in the market opportunities in its margins.

The current world system is facing a similar crisis to that of the slave-based Roman Empire, which could no longer grow extensively (at some point the cost of expansion is greater than the benefits of added productivity), but could not grow intensively either, since that would demand autonomy for the slaves. Hence, the feudal system emerged, which refocused on the local, where it could become much more productive and grow 'intensively'. Serfs, which were tied to the land but now had families, a fixed part of their produce, and a much lighter taxation load, were substantially more productive than slaves. The domain-based lords took a substantially lesser part of the surplus. Today, extensive growth is ultimately blocked, but intensive growth in the immaterial sphere requires a substantial reconfiguration which largely transcends the current system logic.

Similarly, the current structural crisis causes a reconfiguration of the two main classes (just as the slave owners had to become feudal lords, and the slaves had to become serfs). At present, we see the emergence of a netarchical class of capital owners, who are renouncing their dependence on the present regime of immaterial accumulation through intellectual property, in favour of a role as enablers of social participation through proprietary platforms, which cleverly combine open and closed elements so as to ensure a measure of control and profit, while knowledge workers are reconfiguring from a class that was dissociated from the means of production, to one that is no longer dissociated from its means of production, as their brains and the networks are now their socialized means of production. (However, they are still largely dissociated from autonomous means

of monetization.) It would be fair to say that currently, peer production communities are collectively sustainable, but not individually, leading to a crisis of value and widespread precarity amongst knowledge workers.

The solution would in my opinion point in the following direction:

1. the private sector recognizes its increasing dependence on the positive externalizations of social cooperation, and together with the public authorities, agrees to a new historical compromise in the form of a basic income; this allows the sphere of cooperation to thrive even more, creating market benefits

2. the sphere of the market is dissociated from infinite-growth capitalism (how this can be done would require a separate article, but the key would be a macro-monetary reform such as those proposed by Bernard Lietaer, associated with a new regime that extends the production of money from private banks to the social field, through open money systems)

3. the sphere of peer production creates appropriate 'wealth acknowledgement systems' to recognize those that sustain its existence, and systems exist which can translate that reputational wealth in income

Peer governance and democracy

As peer to peer technical and social infrastructures such as sociable media and self-directed teams are emerging to become an important if not dominant format for the changes induced by cognitive capitalism, the peer to peer relational dynamic will increasingly have political effects.

As a reminder, the p2p relational dynamic arises wherever there are distributed networks, i.e. networks where agents are free to undertake actions and relationships, and where there is an absence of overt coercion so that governance modes are emerging from the bottom-up. It creates processes such as peer production, the common production of value; peer governance, i.e. the self-governance of such projects; and peer property, the auto-immune system which prevents the private appropriation of the common.

It is important to distinguish the peer governance of a multitude of small but coordinated global groups, which choose non-representational processes in which participants co-decide on the projects, from representative democracy. The latter is a decentralized form of power-sharing based on elections and representatives. Since society is not a peer group with an a priori consensus, but rather a decentralized structure of competing groups, representative democracy cannot be replaced by peer governance.

However, both modes will influence and accommodate to each other. Peer projects which evolve beyond a certain scale and start facing issues of decisions about scarce resources, will probably adapt some representational mechanisms.

In fact, there are a few things we can already say about the emerging templates of peer governance. In the sharing mode, centered about the sharing of individual expression, where network ties are relatively weak, proprietary third party platforms are responsible for the setting of design rules which have to enable sharing and demand some form of openness that creates the value, but balanced by their need to capture that value, with the exist possibilities and mobilization power of the sharing communities acting as a counterweight. In the commons-oriented form of peer production as seen in free software for example, we see the emergence of a triarchical model, combining self-aggregating 'permission-less' and self-governed community; with a for-benefit association (usually a NGO in the form of Foundations) that manages the infrastructure of cooperation, and subjected to formal democratic rules; and an ecology of businesses creating market value on top of the commons, while returning some of its profit in the form of benefit sharing towards the Foundation or community, thereby insuring the continuation of the Commons on which they depend. These forms templates that will be increasingly used in the expanding field of social production, but are not as such applicable to the polis as a totality.

Representative and bureaucratic decision-making can and will in some places be replaced by global governance networks which may be self-governed to a large extent, but in any case, it will and should incorporate more and more multistakeholder models, which strives to include as participants in decision-making, all groups that could be affected by such actions. This group-based partnership model is different, but related in spirit, to the individual-based peer governance, because they share an ethos of participation.

Towards a Partner State approach

Partner state policy is an approach in which the state enables and empowers user communities to create value themselves, and which also focuses on the elimination of obstacles.

The fundamental change in approach is the following. In the modern view, individuals were seen as atomized. They were believed to be in need of a social contract that delegated authority to a sovereign in order to create society, and in need of socialization by institutions that addressed them as an indifferentiated mass. In the new view however, individuals are always-already connected with their peers, and looking at institutions in such a peer-informed way. Institutions therefore, will have to evolve to become support ecologies, devising ways to create infrastructures of support.

The politicians become interpreters and experts, which can guide the issues emerging out of civil society based networks into the institutional realm.

The state becomes a at least neutral (or better yet: commons-favorable) arbiter, i.e. the meta-regulator of the 3 realms, and retreats from the binary state/privatisation dilemma to the triarchical choice for an optimal mix between government regulation, private market freedom, and autonomous civil society projects.

A partner state recognizes that the law of asymmetric competition dictates that it has to support social innovation to it utmost ability.

An example I recently encountered was the work of the municipality of Brest, in French Brittany. There, the "Local Democracy" section of the city, under the leadership of Michel Briand, makes available online infrastructures, training modules, and physical infrastructure for sharing (cameras, sound equipment, etc...), so that local individuals and groups, can create cultural and social projects on their own. For example, the Territoires Sonores project allows for the creation by the public of audio and video files to enrich custom trails, which is therefore neither produced by a private company, nor by the city itself. In other words, the public authority in this case enables and empowers the direct social production of value.

The peer to peer dynamic, and the thinking and experimentation it inspires, does not just present a third form for the production of social value, it also produces also new forms of institutionalization and regulation, which could be fruitfully explored and/or applied.

Indeed, from civil society emerges a new institutionalization, the commons, which is a distinct new form of regulation and property. Unlike private property, which is exclusionary, and unlike state property, in which the collective 'expropriates' the individual; by contrast in the form of the commons, the individual retains his sovereignty, but has voluntarily shared it. Only the commons-based property approach recognizes knowledge's propensity to flow everywhere, while the proprietary property regime requires a radical fight against that natural propensity. This makes it likely that the commons-format will be adopted as the more competitive solution.

In terms of the institutionalization of these new forms of common property, Peter Barnes, in his important book Capitalism 3.0, explains how national parks and environmental commons (such as a proposed Skytrust), could be run by trusts, who have the obligation to retain all (natural) capital intact, and through a one man/one vote/one they would be in charge of preserving common natural resources. This could become an accepted alternative to both nationalization and deregulation/privatization.

I would surmise that in a successor civilization, where the peer to peer logic is the core logic of value creation, the commons is the central institution that drives the meta-system, and the market is a peer-informed sub-system that deals with the production of rival physical products, along with a pluralist economy that is augmented with a variety of reciprocity-based schemes.

A set of concrete proposals

Just as social innovation and peer production is hyperproductive and 'competitive' in the sphere of corporate competition, so they are also advantageous for any public authorities adopting them in their own territorial spheres.

This gives political leverage to a set of three inter-related proposals, that would sustain a further expansion of peer production:

Here's my proposal, of what we need as transitional measures to further stimujlate social production: .i.e. a set of 3 interlocking institutions, each with its own complementary mission and objectives:

1) **Institute for the Protection and Development of the Commons**

This is an institution that effectively supports the creation and maintenance of the commons,

A) by diffusing knowledge about the legal and institutional means of creating and protecting them.

B) by creating a supportive infrastructure of cooperation that facilitates the creation of commons-oriented initiatives by those who have more difficulties accessing such necessary infrastructure

C) by maintaining relations with, and supporting the operation and maintenance of the for-benefits institutions that are most often associated with commons oriented initiatives

Example: the public support for social value creation in the French city of Brest

2) **Institute for Open Business**

This institution supports the creation of market value in cooperation with the Commons, in ways that are compatible and do not deplete commons-based value creation. Typically, this is the kind of Institution that would support open source software businesses, open textbook publishers, etc.. and support young and starting enterpreneurs who want to engage in such.

Example: the OSBR.Ca initiative in Toronto, Canada

3) **Institute for Benefit-Sharing and Commons Recognition**

This institution focuses on patronage and various forms of support that do not destroy the peer to peer logic of voluntary contributions.

A) It creates a priori prizes, awards, bounties to support individuals involved in commons-based value-creation

B) in cooperation with the companies (stimulated by previous open business institute), it stimulates benefit-sharing practices from companies that profit from commons created value. It acts as a meta-regular for such practices, identifying weak spots and stimulating solutions for them.

C) it creates a posteriori patronage arrangements for individuals with a proven record in commons-based value creation

D) it studies and proposes policies for the overall stimulation of commons-based value creation

A renewed progressive policy centered around the sustenance of the Commons

What does it mean for the emancipatory traditions that emerged from the industrial era?

I believe it could have 2 positive effects:

1) a dissociation of the automatic link with bureaucratic government modalities (which does not mean that it is not appropriate in certain circumstances); proposals can be formulated which directly support the development of the Commons

2) a dissocation from its alternative: deregulation/privatization; support for the Commons and peer production means that there is an alternative from both neoliberal privatization, and the Blairite introduction of private logics in the public sphere.

The progressive movements can thereby become informational rather than a modality of industrial society. Instead of defending the industrial status quo, it becomes again an offensive force (say: striving for an equity-based information society), more closely allied with the open/free, participatory, commons-oriented forces and movements. These three social movements have arisen because of the need for an efficient social reproduction of peer production and the common.

Open and free movements want to insure that there is raw material for free cultural production and appropriation, and fight against the monopoly rents accorded to capital, as it now restricts innovation. They work on the input side of the equation. Participatory movements want to ensure that anybody can use his specific combination of skills to contribute to common projects, and work on lowering the technical, social and political thresholds; finally, the Commons movement works on preserving the common from private appropriation, so that its social reproduction is insured, and the circulation of the common can go on unimpeded, as it is the Commons which in turn creates new layers of open and free raw material.

These various movement come in the usual three flavours:

1. transgressive movements, such as young and old filesharers, which show that the legal regime has to be changed

2. constructive movements, which create a framework for new types of social relationships, such as the Creative Commons movement, the free software movement, etc...

3. reformist or radical attempts to change the institutional regime and adapt it to the new realities

I personally believe that these movements will not create new political parties, but that these networks of networks will indeed look for political liaison. While peer to peer is a regime that combines equality and liberty and therefore potentially combines elements from various sides of the political spectrum, I believe the left is particularly apt to forge an alliance with the new desires and demands of these movements. It remains to be seen whether new political and cultural expression of the emerging free culture, such as the Swedish Pirate Party, will change that expectation by creating a new kind of political force, more directly in tune with peer production communities.

There is also a connection with the environmental movement. On one side, the culturally-oriented movements fight against the artificial scarcities induced by the restrictive regimes of copyright law and patent law; on the other side, the environmental movement fights against the artificial abundance created by unrestricted market logics. The removal of pseudo-abundance and pseudo-scarcity are exactly what needs to happen to make our human civilization sustainable at this stage. As has been stressed by Richard Stallman and others, the copyright and patent regimes are explicitly intended to inhibit the free cooperation and cultural flow between creative humans, and are just as pernicious to the further development of humanity as the biospheric destruction.R

Finally, restoring the balance between a scarcity-recognizing material regime, and a abundance-recognizing immaterial regime, cannot be seen as separate from the efforts of social forces to obtain more social justice, thereby linking the new open/free, participatory and commons-oriented forces with emancipatory social movements.

There is therefore a huge potential for such a renewed movement for human emancipation to become aligned with the values of a new generation of youth, and achieve the long-term advantage that the Republicans had achieved since the 80s.

CONCLUSION: WHAT NEEDS TO BE DONE?

Let's recall some of our points, and see how the movement against artificial scarcity and for sustainability intersect.

We live in a political economy that has it exactly backwards.

We believe that our natural world is infinite, and therefore that we can have an economic system based on infinite growth. But since the material world is finite, it is based on pseudo-abundance.

And then we believe that we should introduce artificial scarcities in the world of immaterial production, impeding the free flow of culture and social innovation, which is based on free cooperation, by creating the obstacle of permissions and intellectual property rents protected by the state.

What we need instead is a political economy based on a true notion of scarcity in the material realm, and a realization of abundance in the immaterial realm. Complex inno-

vation needs creative and autonomous workers that are not impeded in their ability to share and learn from each other.

In the world of immaterial production, of software, text and design, the costs of reproduction are marginal and therefore we see emerging in it non-reciprocal peer production, where people voluntary engage in the direct creation of use value, profiting from the resulting commons in a general way, but without specific reciprocity.

In the world of material production, where we have scarcity, and costs have to be recouped, such non-reciprocity is not possible, and therefore we need modes of neutral exchange such as the markets, or other modes of reciprocity.

In the sphere of immaterial production, humanity is learning the laws of abundance, because non-rival goods win in value through sharing. In this world, we are evolving towards non-proprietary licences, participatory modes of production, and commons-oriented property forms. Positive forms of affinity based retribalization are emerging.

But in the world of scarce material goods, a series of scarcity crises are brewing, global warming being just one of them, that is creating the emergence of negative forms of competitive tribalizaition.

The logic of abundance has the potential of leading us to a reorganization of our world to a level of higher complexity, moved principally by the peer to peer logic.

The logic of scarcity has the potential of leading us to generalized wars for resources, to a descent to a lower form of complexity, a new dark age as was the case after the disintegration of the Roman Empire.

So the challenge is to use the emergent logic of abundance, and inject it into the world of scarcity.

Is that a realistic possibility?

In the immaterial world of abundance, sharing is non-problematic, and the further emergence and expansion of non-reciprocal modes of production will be very likely. “Together we know everything”, is a rather achievable ideal.

In the material world of scarcity, abundance is translated into three key concepts that can change human consciousness and therefore economic practices. The notion of ‘together we have everything’ seems not quite achievable, we therefore need transitional concepts.

The first concept is the distribution of everything. This means that instead of abundance, we have a slicing up of physical resources and the physical means of production, so that individuals can freely engage and act. This means an economy that moves towards a vision of peer-informed market modes such as fair trade (a market mechanism subjected to peer arbitrage of producers and consumers seen as partners), social entrepreneurship (using profit for conscious social progress). Objective tendencies towards miniaturization

of the physical means of production makes this a distinct possibility: desktop manufacturing enables individual designers; rapid manufacturing and tooling are diminishing the advantages of scale of industrial production, and so do personal fabricators. Social lending creates a distribution of financial capital; and the direct social production of money through software is not far away from being realized in various parts of the world (see the work of Bernard Lietaer); If indeed scarcity will create more expensive energy and raw material, a re-localisation of production is likely, and peer-informed modes of production will be enabled to a much greater extent.

The second concept is sustainability. Since an infinite growth system cannot last indefinitely, we need to move to new market concepts as described by the throught schools of natural capitalism (David Korten, Paul Hawken, Hazel Henderson), capitalism 3.0 (Peter Barnes' proposal to use trust as property forms because they impose the preservation of capital), cradle to cradle design and production processes so that no waste is generated. We need to move to a steady-state economy (Herman Daly), which is not necessarily static, but where greater output from nature, is dependent on our ability to regenerate the same resources.

The third concept is that of sufficiency or 'plenty'. Abundance has not just an objective side, it has a subjective side as well. In the material economy, infinite growth needs to be replaced by sufficiency, a realization that status and human happiness can no longer be dependent on infinite material accumulation and overconsumption, but will become dependent on immaterial accumulation and growth. Having enough so that we can pursue meaning and status through our identity as creative and collaborative individuals, recognized in our various peer communities.

Only a rich experience economy can avoid a culture of frustration and sacrifice, and the repressions and unhappiness that such could entail. This experience economy however, will not just be created by commercial franchises, but there will also be the direct social production of cultural value. Businesses and peer communities, enabled and empowered by a partner state, will have to create a rich tapestry of immaterial value, and the thicker the surrounding immaterial value of being, the lighter our attachment to mere having will be.

Scenarios for the current meltdown

How does the current meltdown/slump, which started with the financial collapse in the fall of 2008, affect the above vision, elaborated before this non-linear emergence of crisis.

There are two ways to read the crisis. The first is, inspired by Carlota Perez work on long-term cycles, is to see the current crisis as the end of the cycle which started in 1945, first with a 30-year high-growth phase, then with a low-growth neoliberal phase, based on stagnating wages and debt-fueled consumption, financed by the new Asian powers. As this model, and the immense financial bubble it created fails irrevocably, we could

expect, after a long slump that will last at least a decade, a new expansion fase of capitalism, based on green capitalism and the change of institutions by the internet revolution (a process which has only happened in civil society and at institutional margins, without resulting in a new equilibrium). In such a scenario, a new social compact would be struck with the new structure of social demands created by the emergence of peer to peer, allowing it to grow from its present seed phase, to a level of parity at the end of the next growth phase. If our interpretation of the impossibility of infinite growth in a finite natural system is correct, the ultimate failure of attempted green capitalism, would set the stage for a phase transition, in which the peer to peer system, would become the core of the new society, as explained in the body of our text. I have called this the high road towards peer to peer, because, despite the cyclical crisis moments, the transition could still be relatively smooth, replacing the former structures at a very high level of productivity, minimizing social pain.

There are two possible derailments with this scenario. The first is that the failure by the Obama administration to structurally reform the system and break the power of the predatory financial caste, so impoverishes the possibilities of the state, that no means are left for social policies, leading to global dislocation, and a turn by humanity towards resilient communities, using p2p-inspired models on a local scale. The second derailment refers to the combined effects of the structural problems of capitalism as a system, and not just to its long cycles. In this scenario, the accelerating issues around climate change, peak oil and resource depletion, become to severe and do not allow for the generation of a new expansion phase. This element alone, which can be combined with the first one, also leads to global dislocation, and to the resilient communities scenario, involving a 'low road' towards peer to peer, in the context of immense social pain.

Relation to the former Marxist scenarios of social change

All of the above can be read as an argument with the previous Marxist theories of social change.

I would summarize the political attitude of the socialist movement as: workers need to take power, then change society towards a new economic and political social structure.

But this has never been how phase transitions from one form of civilization to another really happened.

Change from slavery to feudalism happened because some slave-owners, undoubtedly under pressure for example from slave revolts in the context of a collapsing state infrastructure, started to turn their slaves into coloni, and an increasing number of them did so, creating the conditions for a phase transition towards feudalism. The fundamental change could happen because of a congruent set of changes both between those that produced, and those that managed and profited from the production.

Change from feudalism to capitalism happened because, in the context of a crisis of

feudalism after the 16th century, part of the nobility could see the superior productivity of capitalist enterprise, and funded and joined such projects, leaving behind their peers who stayed tied to the land. As the crisis intensified and the new hybrid capitalist class became dominant, political revolutions finalized the phase transition.

Socialism did not have a superior mode of production which could change capitalist society from within, and prepare for the phase transition.

In contrast, the hyperproductivity of peer production has already created a new class of netarchical capitalists, investing in social production, and already taking power through the Obama administration. By investing in hybrid forms of peer production, they paradoxically strengthen the post-capitalist logics within capitalist society. It is the congruence between peer producers and netarchical capitalists which is driving the change, eventually causing the seed form of peer production to rise to parity level, perhaps leading to the ultimate phase change.

Within a declining and crisis-ridden system which is destroying the biosphere, the congruent social forces of peer producers and netarchical capitalists is creating the conditions for a ulterior phase change.

The political struggle today is to help sharing communities defend and promote their interests with the platform owners; and to help autonomous commons-oriented peer producing communities to maintain their autonomy as they cooperate with their business ecologies, thereby changing the very practices of the corporations.

So what is happening is that within the old, new successful patterns are being created, and that these patters start synergistically interacting to form an integrated alternative set of social practices.

As this new sphere grows, it creates a living alternative within the declining global system, forming a real alternative that can inspire the social movements still rooted in the capitalist world of labour, creating the conditions for political and social transformations of the mainstream structure of society.

Such a change if it occurs would be congruent with what we know about phase transitions in the past.

Section 2
Institutional Spaces

Digital Spaces for Learning and Assessment in Art and Design

Ian Pirie, Stewart Cordiner and Jenny Triggs

ABSTRACT

Assessment and feedback in all subjects remains a key challenge for educators and none more so than in the visually creative disciplines. National student surveys consistently indicate student dissatisfaction with this aspect of their education regardless of their engagement and enjoyment with almost everything else.

Edinburgh College of Art recently redesigned its approach to assessment and feedback. A grade-based scheme, fully constructively aligned to learning outcomes, was implemented using formative assessment and student self-evaluations to enhance learning and understanding of their progress.

In 2010 a digital environment was designed to support these pedagogical principles and philosophies and provides a digital space for students and tutors to engage, develop, record, inform and validate the learning, progress and assessment. Substantive amounts of information have been generated, revealing how our approach is impacting positively on the student experience and in changing perceptions on the purpose of assessment.

Evidence indicates improvements in: self-critical reflection, accuracy in graded self-evaluation and participation in assessment. Now, following critical discourse, students have a central role in formulating their own feedback and future actions, and the benefits of this shared-responsibility partnership model are becoming clear.

Designing an appropriate online digital space to support studio pedagogy has enabled assessment to enhance learning. The paper reveals the journey and explores and proposes new scenarios on how the use of digital spaces can further change the ownership, purpose and use of assessment to the benefit of students while assuring overall quality and standards for the institution.

Keywords: Assessment, Feedback, Art, Design, Online Learning Management, Mutually Constructed Feedback

INTRODUCTION

There is substantial evidence in the literature that both formative assessment and feedback are considered helpful to students and are regarded by many educators as central to their students' ability to learn effectively (Black, Wiliam 1998) et.al.

The Art and Design pedagogy is well suited to continuous formative assessment and feedback given its iterative nature and constructivist approaches. Yet students studying Art and Design remain largely dissatisfied with the frequency, quality and effectiveness of the feedback they receive and this is often compounded by the lack of clarity and understanding in how they are assessed.

This of course is not limited to students of Art and Design and is a major issue across the higher education sector more generally, but given the nature of the education and student experience in Art Colleges - often consisting of small groups, one-to-one tuition / tutorials, frequent critiques and presentations with peer interactions, learning through iterative practice, predicated on projects and themes of enquiry, highly personalised and student centred - it is all the more remarkable that this problem nonetheless remains. This paradox is explored fully in *'I can't believe it's not better': The Paradox of NSS scores for Art & Design by David Vaughan and Mantz York* which seeks to understand the underlying issues of students' dissatisfaction in an otherwise, some would regard, idyllic educational environment.

Evidence suggests that the lack of transparency and understanding of assessment criteria, misunderstandings of the purpose and what constitutes feedback from a student's perspective is a key factor, as is a perceived lack of course organisation and management; the latter as a result of creating freedom within highly individualised programmes of study - '*There was also a common concern that the pedagogy of Art & Design could mean that the more a student has creative freedom the more they are likely to experience what they believe to be a failure of Organisation & Management*' (Vaughan, Yorke 2009)

Dissatisfaction with assessment and feedback are two interrelated issues that Edinburgh College of Art (ECA) sought to address as part of a strategic review and redesign of its approach to assessment, feedback and curriculum description. This was subsequently followed by the development and implementation of a purpose-designed learning management system to provide organisation and structure around each programme of study, and an individual and personalised digital space for each student while maintaining flexibility, the aim being to support the face-to-face 'creative' pedagogy while providing an organised framework and private space to facilitate tutor and student discourse, create and record tutorials, feedback and assessment.

The paper outlines the aims of the assessment scheme, new approaches to feedback, its subsequent impact for students and staff, the development and implementation of a dedicated learning management system (LMS) to further enhance the effectiveness of the approach and, based upon analysis of the LMS data, proposes the principles and types of characteristics and attributes that need to be present for students to fully understand and value assessment and feedback as an effective and integral part of their learning.

WHY DO WE BOTHER ASSESSING ANYTHING AT ALL?

The following is an extract from the Edinburgh College of Art assessment handbook that outlines six reasons why assessment probably needs to exist within an academic institution where there is both an internal and external requirement to demonstrate explicitly that standards are being achieved, maintained and quality assured.

For Students:

- to provide feedback to the student regarding their progress and to support and guide their further learning;
- to describe student attainment and inform decisions on progression and awards.

For Staff:

- to determine that the intended learning outcomes of the programmes are being achieved and how well;
- to inform programme design and further curriculum development.

For the College:

- to demonstrate to external agencies that quality standards are being assured and maintained;
- to demonstrate that the College is achieving its particular mission.

Most Universities could reasonably assume, and most likely evidence, that they are successfully achieving numbers two to six but arguably students are most concerned with number one. If the prime reasons for assessing students are to satisfy the requirements of staff, the institution and external agencies, this would support the view that the type of assessment models most commonly used are primarily designed to test and measure the standards achieved by a cohort of students at the end of a period of learning and are for the benefit of others rather than to benefit the student during their learning.

Feedback from students in course evaluations, focus groups and student surveys indicates that clarity in understanding how they are assessed and receiving high-quality, timely, feedback is a key issue and is largely driven by a simple desire to know 'how am I progressing?' and 'how can I improve my work?' Although Art and Design students, like many other students, aspire to achieve high grades (this is of particular importance at the honours classification level), by the nature of their study they are primarily driven to improve upon their artistic and design work and, if assessment is to be used as a productive tool for learning, then something needs to change.

The literature clearly demonstrates that there is an overwhelming body of evidence to suggest that something is not right, yet conventional approaches to assessment are all too common. The Objectivist approach (rather than Constructivist approach) described

by Biggs in 1996 as the dominant theory in use and one which led to assessment being primarily concerned with quantitative measurement is still very much in evidence in 2011 (Biggs 1996), regardless of the fact that a substantive body of research indicates that this approach to assessment design encourages superficial and surface approaches to learning (Watkins, Dahlin et al. 2005) et.al.

This model, however, was never appropriate or relevant for assessment in Art and Design and, although assessment in these subjects is regarded as being robust within the field and can provide the evidence to satisfy the requirements of the institutional measures identified above, it is frequently 'opaque' and a 'bit of a mystery' to students and often fails to capitalise on the iterative nature of the pedagogy which arguably lends itself better to a continuous formative assessment and feedback model.

The theories of the Constructivist approach are ideally suited to describing the learning models in Art and Design disciplines, in that much of the knowledge is developed and constructed through iterative practice as explored and described by Kolb (Kolb 1984). It is simply impossible for students to study only the theories, context and history of an art or design discipline if they wish to emerge as practitioner in that field. Students studying art and design frequently produce large amounts of material in the form of theoretical, historical and visual research, concepts and ideas all made manifest in many forms and in multiple media (e.g. drawings, written texts, photographs, videos, models, prototypes, digital media), as well as through completed and resolved art or design work created using a wide range of materials and processes, and their developing knowledge is almost always applied and tested within a real or simulated professional context. It should therefore be relatively straightforward to develop a model of assessment and feedback to both help students learn during the learning process itself and to assess and measure the standards achieved at the end of a cycle of learning - but alas not so!

WHY ASSESSMENT NEEDS TO CHANGE

In developing a new approach to assessment at ECA a number of guiding principles were already in place. The Scottish higher education sector introduced a credit and qualifications framework in 2000 (Scottish Credit and Qualifications Framework 2000) and this had already established a number of core attributes, described under five broad headings of learning, that institutions were encouraged to incorporate and make explicit within their course and programme descriptions. The framework is also predicated on levels of learning and a learning outcomes approach. This provided the College with a contextual framework to review what was actually being assessed and in particular the relationship between what was being taught, the learning outcomes as described and how these were written, as well as the assessment practices themselves. It was clear that staff across the disciplines knew exactly what they were assessing and the consistency and rigour in the team-based approaches with subsequent moderation ensured robustness and fairness in the assessment process. What was less clear and not at all explicit was the relationship between the assessment, what was being taught and learned and the

learning outcomes that students were expected to achieve. Also, despite the many opportunities to provide formative assessment throughout a level of study, this rarely occurred in a formal way and, as is customary in many undergraduate art and design programmes, the summative assessment took place at the end of the level of study, at ECA after thirty weeks.

The revised assessment scheme was developed with significant involvement from staff across the College with key inputs from the Heads / Associate Heads of Schools, the Programme / Award Leaders and the College Quality Officers / Academic Registry. What emerged from the discussions was a set of key attributes and principles that staff believed would lead to a simplified approach to assessment that would be both desirable and manageable in practice. Of prime importance was to both clarify and make explicit to students what was being assessed (and how) and to move to a position of productively using formative assessment as an integral part of learning and not something that students feel happens to them, but rather something that they can feel part of. For example, a great deal of time and effort is expended by students preparing their visual and written work to present or exhibit for assessment. Under previous systems students were then required to leave, and at some later point, a pass or fail and associated grade emerged; this approach simply compounds the 'mystery' of what goes on behind closed doors in the assessment studio and students naturally feel excluded from this part of the process.

One of the key principles that was established is that what is being assessed is the learning and that the 'body of work' (in what ever form) is the vehicle by which the student evidences whether they have achieved the learning outcome(s) required and to what standard. This was and is of paramount importance in the context of Art and Design in that the art or design work itself is not being assessed directly but is 'the means by which' the student (the learning evidenced and standards achieved) is being assessed. This change is a fundamental shift that aims to help students understand what is actually being assessed, and that it is not the subjective 'likes or dislikes' of their tutor(s) that determines the outcome. An equally important principle was to try to involve students directly in assessment wherever possible to develop a shared-responsibility and partnership model of learning; this is explored more fully in the potential of the LMS to facilitate 'mutually constructed feedback and actions'.

The following key principles now provide the foundation for the assessment and feedback scheme at ECA:

- assessment tasks are constructively aligned to the learning outcomes
- all learning outcomes are graded independently to create an assessment profile
- a letter-based grade scheme is used to provide clarity of achievement
- all learning outcomes must be achieved
- aggregation cannot compensate for failed learning outcomes
- staff provide formative grades and written formative feedback for all assessed tasks

- students self-evaluate and grade themselves throughout
- students are required to reflect upon and contribute to writing their own feedback and action points.

The Schools of Painting and Architecture ran the evaluation pilot in 2007-08 and the scheme was implemented fully in session 2008-09. An early success identified during the pilot was the accuracy of the students' graded self-evaluations. At the mid-year assessment review in the School of Painting over 80% of the students achieved a direct correlation with their tutors' assessment of their work; tutors were not aware of the students' self-evaluation grades until after they had completed their own assessments.

The following aims and assessment principles were subsequently established and embedded within the College regulations and made explicit to students and staff in the Assessment Handbook which outlines the philosophy and guiding principles of the new approach.

EXTRACT:

Academic Regulations: D1 Assessment Handbook Approved by Academic Council 14-09-09 updated

This assessment handbook has been developed primarily for students and staff of the College and aims to assist in achieving the following:

i. to help make assessment and the assessment process understandable, explicit and transparent;

ii. to create a consistent approach to assessment practices across eca;

iii. to promote and embed the use of assessment as an integral part of learning;

iv. to ensure that the quality and standards of awards are maintained.

Principles of Good Assessment Practice

2.2 In order to achieve these purposes, the following principles inform and are embedded in the conduct of assessment at the College:

I. Students receive regular formative feedback on their progress which is related directly to the published learning outcomes in their Module Descriptors and in their coursework material, such as project briefs and individual programmes of study;

II. Students receive a minimum number of written tutorial feedback/ crit reviews per stage and the written feedback is directly related to the published learning outcomes, as referred

to above;

III. The grading of student work is undertaken with close reference to the published learning outcomes and assessment criteria, for the Module Descriptor and for the particular piece(s) of work being assessed;

IV. The method of assessment used is appropriate to the learning outcome(s) being assessed and the student's performance for each individual learning outcome can be effectively examined and graded where a single method of assessment is used to examine more than one learning outcome;

V. Students are made fully aware of how they are being assessed, what is being assessed and against the published criteria.

2.3 The assessed elements throughout each Level ensure that the generic competencies, as described and required in the Scottish Credit and Qualifications Framework (SCQF), have been successfully achieved prior to progression to the next stage.

2.4 Assessment should generate valuable student learning activity and work which both students and staff value.

Good assessment practice should mean that it is perfectly possible to explain to students, staff and external agencies what is actually being assessed. This was a key issue (and a challenge) in the context of Art and Design education where, as indicated previously, staff knew exactly what they were assessing but found difficulty in making this explicit to students in an accessible and understandable form. Confusion can exist when there is a lack of clarity between subjectively measuring the perceived quality of an artefact and objectively measuring the learning outcome being assessed; a key aim was to help students understand this.

The developments in assessment at the College were founded on experience of what was not proving successful (for the students) and therefore needed to change, but was also informed by the mounting research evidence of what is deemed good and/or desirable practice. Art and Design education (for the most part) uses approaches in learning that engenders 'deep' learning. There is substantive evidence that our graduates possess the types of key skills and attributes that are highly desired by employers and necessary for the graduates to survive and flourish as successful artists and designers. What was or is missing in the pedagogical approach is the direct use of assessment to inform and enhance further learning. If a new approach could be successfully embedded that required the student to participate fully in the assessment and feedback process (to the extent of self-assessing, writing their own feedback, reflecting upon this and developing subsequent actions), the hypothesis is that this would enhance their satisfaction, increase their understanding, accelerate their learning and consequently raise standards.

In this facilitated learning model students and staff have a genuinely shared respon-

sibility for the quality of the learning experience. There would be no action without a consequence. As an example, where a student requested a tutorial there would be a joint responsibility to mutually record, construct the feedback/feed-forward and identified course of subsequent actions. The student would be responsible for 'writing-up' their own tutorial report, and the tutor for confirming its accuracy and understanding. Receiving feedback would no longer be a passive activity with which students could choose to engage. Neither student nor staff could be exempt from their partnership responsibility and although tutors would still be required to record their tutorial discussions, more emphasis could be placed on the tutor validating that the student has fully understood what was said to them.

WHAT MIGHT MAKE A DIFFERENCE?

For this facilitated and supportive model of feedback to work, the characteristics, attributes and philosophy of the approach must be fully understood by both staff and students and subsequently adhered to; in practice this requires a significant culture shift and 'buy-in' from all staff and participative induction for students as an integral part of their learning.

The extrapolation of the 'constructive alignment' model means that assessment must also, therefore, be 'constructivist' in approach and should include everything from the design of the curriculum, to learning outcomes, the learning and teaching methods and, importantly, the assessment methods (Rust, O'Donovan et al. 2005). When tutors are designing projects/tasks they do so mindful of expecting their students to begin developing their abilities to research, collate, analyse, synthesise, select, interpret and develop unique, novel and/or innovative solutions to the problem, opportunity or theme of enquiry explored. Tutors are then disappointed if their students develop ordinary, 'tired' or obvious solutions to a given task or exploration and would deem the project/learning experience (and its design) unsuccessful.

This is unusual for most other subjects, certainly at undergraduate level, and poses a particular challenge for making assessment criteria both explicit and useful to learning. This requirement from level one for students to be innovative, original, think laterally, take risks, get things wrong, before beginning to consistently develop highly-personalised and often unique and original qualities in their work is a highly-prized characteristic of education in art and design. The approach to assessment and feedback needs, therefore, to be designed to support this frequently 'erratic' journey without students perceiving assessment as a barrier, a hurdle or a punitive or negative experience. In an art or design context fear of failure in assessment inevitably leads to students 'playing-safe', requests to tutors of 'what do I need to do to pass?' and, ultimately, to superficial learning which is precisely the opposite of what the tutors wish.

> 'The only person that understands the learning outcome is the person that wrote it', Susan Orr (2010)

Clarity in the writing of learning outcomes and their associated and explicit assessment criteria to support a framework where creativity can flourish then becomes paramount. This, however, can only be achieved once it has been established what is actually being assessed. Given the diversity of output expected from students, and the approach of not assessing art or design output directly but instead assessing how students have evidenced their learning, clarity in the description of learning outcomes becomes a critical component of the overall assessment scheme. The mutual understanding of learning outcomes continues to be a challenge and led to the thinking that mutual understanding of the feedback was also far more important to the student (and tutors) than the giving or receiving of it.

> 'Assessment and feedback practices should be designed to enable students to become self-regulated learners, able to monitor and evaluate the quality and impact of their own work and that of others.', David Nicol (2010)

Despite the ECA assessment and feedback model now containing many of the desirable principles and characteristics identified in the literature, many students still maintain that they do not quite understand how they are assessed and that the feedback is still not helping them in the way they think it should (Nicol 2010a). It is clear from the evidence gathered that for feedback to be really helpful to a student it is not enough for them to receive it timeously, but that they also have to be engaged with it and, most importantly, understand it. One way to achieve this is for students to 'write-up' and record their own understanding of the feedback given in response to critique and tutorial discourse; to reflect upon this discourse and formulate their own subsequent/consequent actions in addition to those recommended by their tutor. The tutor's responsibility is to stimulate the discussion, provide their feedback, and to 'write-up' and record what was said to the student succinctly. Subsequently, the tutor validates the accuracy and understanding (or lack) of the student's version of the feedback record. Where it is clear that the student has not fully understood what was meant, additional tutorials and guidance can be put in place.

Students are quite clear that they highly value the interactions with both their tutors and peers. It is commonplace in art and design education to require students to routinely present their work at different stages of development and in particular at the end of a project or period of learning. The 'crit' often requires students to articulate, justify and 'defend' the decisions they have made in the execution of their work and these interactions are considered to be valuable learning experiences by both students and tutors (Horton 2007). Evidence suggests that the next stage of learning should not, however, be to move straight on to the next project/assignment but should be a 'deconstructing' of the learning that has just occurred and ideally a period of 'facilitated reflection' prior to commencing the next project/assignment (Kolb 1984).

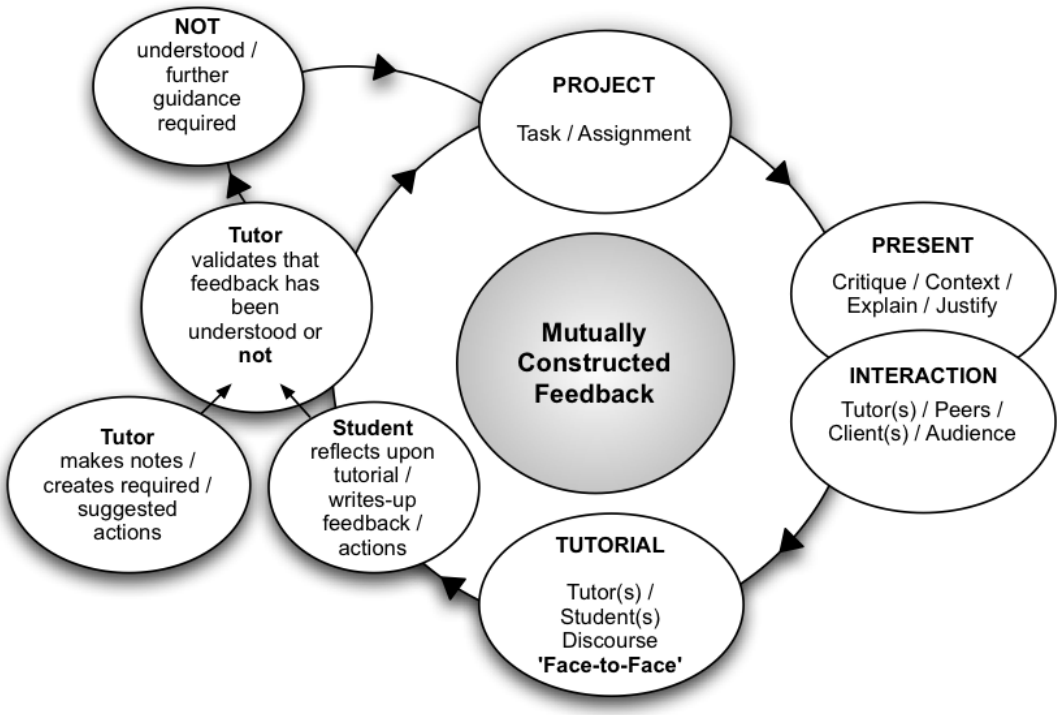

Figure 1. - Mutually Constructed Feedback

The difference from traditional approaches to providing feedback which is proposed in the model shown as (fig. 1) is that there is a mutual responsibility for creating the feedback and the next set of actions. Once the student(s) and tutor(s) have held the tutorial, both parties are responsible for reflecting, recording and writing up their notes. Both the tutor and student should develop and agree the suggested/required actions. To make certain that the learning experience has been effective there is a further stage for the tutor, and that is to validate each student's record of their feedback to ensure they have understood and made sense of what was discussed and what is now required.

Although feasible, managing such interactions through a paper-based approach is likely to fail and it is with this in mind, along with the necessary attributes and challenges outlined above, that a purpose-designed and dedicated learning management system was developed with the potential to facilitate these types of approaches for generating and recording useful, high-quality re-usable information around feedback and assessment for each student and their tutors.

WHY ONLINE?

Any assessment scheme relies on the accurate recording and distribution of information in order to fulfil the purposes described previously. Historically this has meant

paper-based pro-formas of various kinds to gather data for inputting into systems. These pro-formas have to be designed, duplicated and distributed for use; completed and authenticated; then collected and returned for data collation, entry and archiving. Their conversion from word-processed or spread-sheet files to physical paper, then back again to database or spread-sheet data on local or central systems is fraught with the potential for error. At best, administrative staff might pre-populate the forms with student data using mail-merge or similar, and email the files, sensibly-named, for digital completion and printing by staff; at worst, blank pro-formas requiring photocopying and manual completion are distributed.

Photocopying would also inevitably come into it somewhere, with all the concomitant quality, confidentiality and cost issues. Having redesigned its approach to assessment and feedback, Edinburgh College of Art (ECA) implemented a grade-based scheme, fully constructively aligned to learning outcomes, using paper pro-formas to gather student self-evaluations, and deliver formative assessment and feedback. For any paper-based scheme which attempts to improve the frequency and/or quality of feedback, the sheer volume of paper required for each assessment comes at a considerable material and logistical cost to students, staff and administrators, and militates against frequent use. The cumulative total after a single academic session at ECA was substantial and space-consuming, and apart from final marks or grades, any gathered qualitative information was rarely referred to due to the difficulty of accessing it. While learning outcomes and assessment criteria were more explicit and visible, students struggled to understand them or their relationship to the work they had produced, so the impact of the scheme was compromised.

It became obvious that the way ahead was fully digital, but the 'off-the-shelf' VLE in use at the time was not popular with staff or students and its use was limited to the more 'theoretical' areas, where lecture and assignment information was delivered and mainly used in a 'digital filing cabinet' mode, but no assessment or feedback. Students were also expressing dissatisfaction with communication in general. Confusion existed between different sources of information: email, VLE, a rather user-unfriendly student portal, a website and various noticeboards.

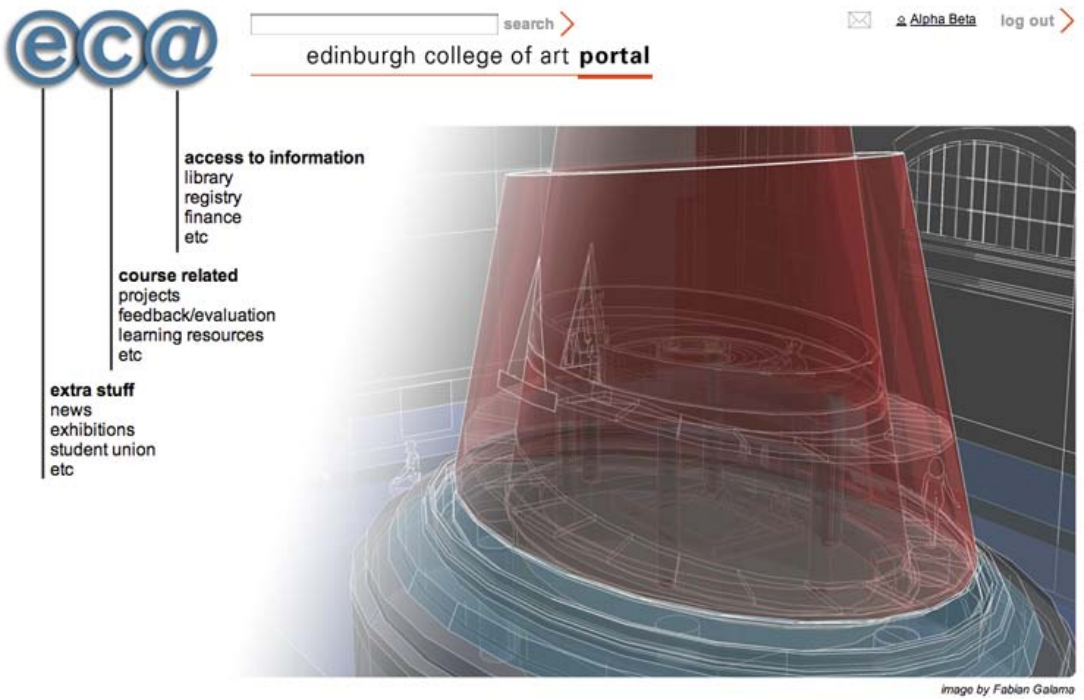

Figure 2. - ECA Portal

The decision was taken to develop a bespoke integrated communications system, using central data sources to personalise information and to ensure accuracy and currency, and to include a Learning Management System to facilitate and enhance the delivery and assessment of student work, both practical and theoretical (Hatziapostolou, Paraskakis 2010). This was not to be a 'Virtual Learning Environment', but a support mechanism for the real learning environment of the studio, workshop and lecture theatre. At the same time, an attempt was made to agree protocols for the delivery of different kinds of information, with the specific aim of cutting down on duplication, improving 'targeting' and personalising of information, and encouraging a more proactive approach to information acquisition, rather than the passive and unstructured 'receiving' mode exemplified by email. This 'proactive engagement' concept became one of the underlying principles for the development. (Rust, O'Donovan et al. 2005)

In consideration of the heightened visual sensitivity of the art and design target community, great care was taken in the design of the system, both visually and functionally. The overall navigation structure and all the interface elements and workflows were designed and built as 'click-through' models by an experienced graphic design academic. This allowed basic user testing, before being translated into fully functioning web tools by the development team, and connected to the relevant data sources. This mutually respectful methodology proved invaluable in the agile initial development and its subsequent modification in response to user feedback.

The project or assignment (the usual medium for the delivery and assessment of practical studio work across the art and design sector) forms a crucial element of the system. (Lee 2009) As a result of its connections to central data sources, the system allows staff to use a project framework to deliver instructions, specifications and resources, together with schedule, learning outcome(s) and assessment information, to specific students, as shown in the diagram (Fig 3.) below:

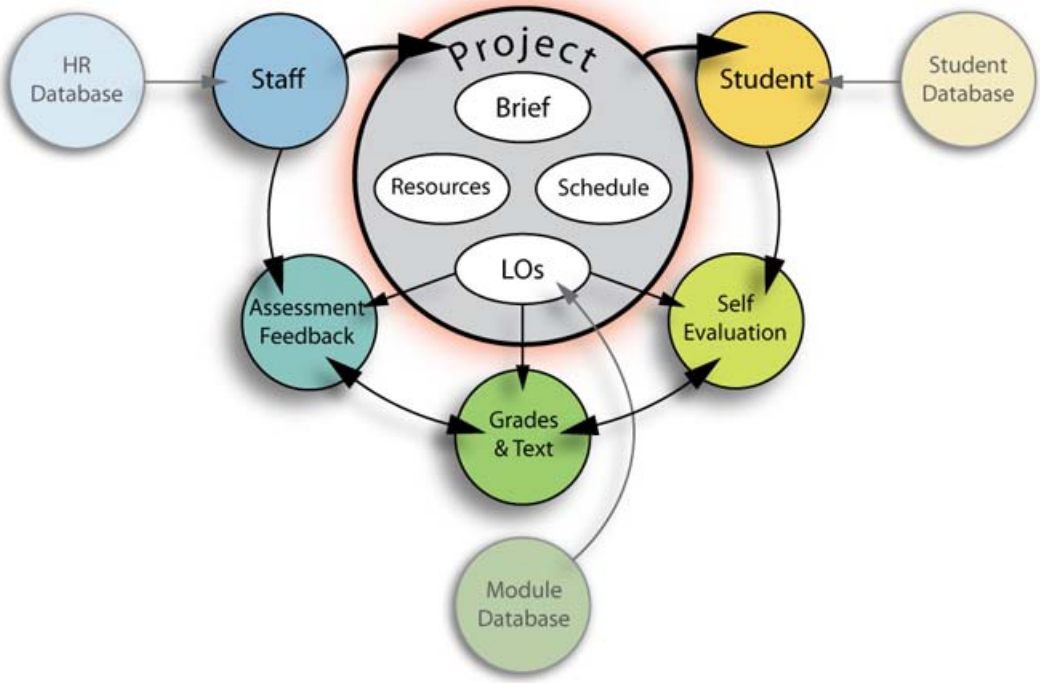

Figure 3. - The Anatomy of a Project and its Relationship to Central Data Sources

The system also allows students to provide a reflective evaluation of their performance in the project, by grading themselves against the associated learning outcomes and by using free text; similarly, staff assessment grades and feedback information is recorded. The design of the interface allows both parties to see their respective grades and comments side-by-side, accumulating over time to form a profile of achievement. The ability to easily revisit the performance history and related feedback, from anywhere at any time, is a key benefit of an online solution.

Some 'behaviour reinforcement' approaches were deployed: the agreement that projects could only be delivered through the system (no paper versions were to be used), maximising instant 'buy-in' across the College and that students would only be able to see their feedback after they had provided their self-evaluation, encouraging active participation and engagement in the assessment process. (Rust, O'Donovan et al. 2005) (Nicol 2010b)

HOW IT WORKS

Upon login, the system authenticates the user and presents them with personalised information according to their profile; staff and students have a similar overall view and navigation structure, but a different set of tools. Staff can build projects or assignments for their students using a tabbed editor interface, with each tab dealing with a specific component of the project - students, learning outcomes, brief, schedule, resources, staff - presented in a logical order.

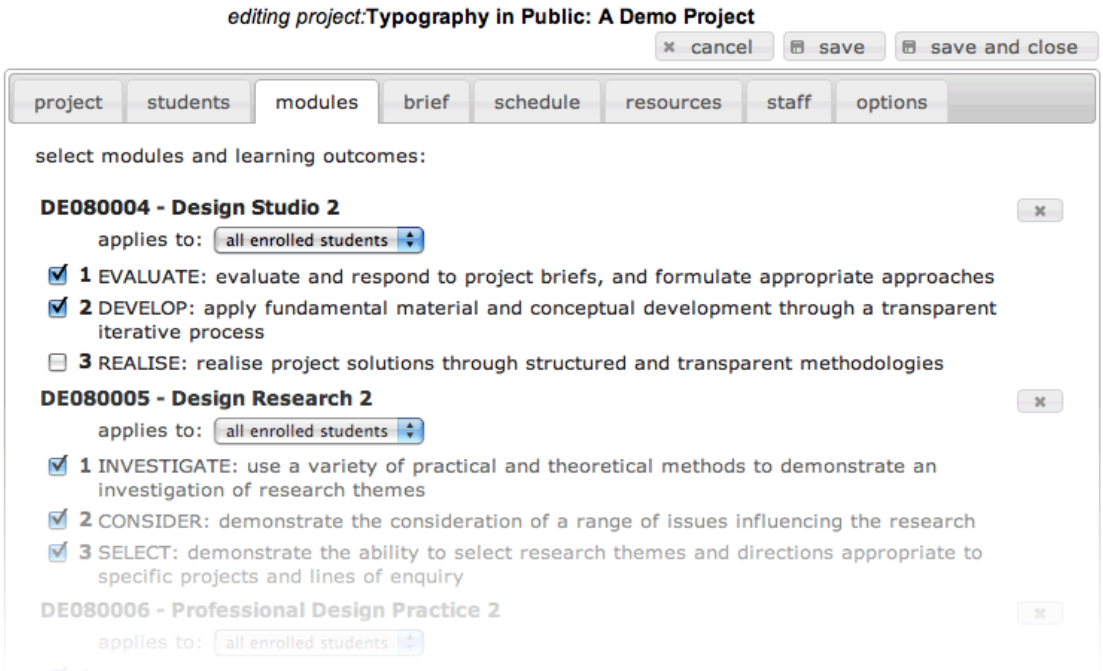

Figure 4. - Project Editor

Choices made in one tab can affect the content of a subsequent tab. For instance, setting the start and finish dates of the project generates a calendar encompassing those dates, onto which specific events can be mapped, complete with text giving instructions, descriptions, locations, times, etc., thus providing the student with a detailed schedule for the duration of the project and a sense of what will be involved. Student, staff, learning outcome and resource information is selected from central data sources, ensuring accuracy and currency, and a standard text editor is used for compiling and formatting the text of the brief - requirements, guidelines, submission of work, etc. Apart from the start and finish dates, two other important dates are added to each project: the '*release*' date and the '*self-evaluation*' date. Prior to the release date, staff can work on designing and creating projects/assignments at any time in advance, in partnership with colleagues if they wish, saving as they go. Only when the project 'release' date is reached will it appear

in the project list of the students who have been targeted.

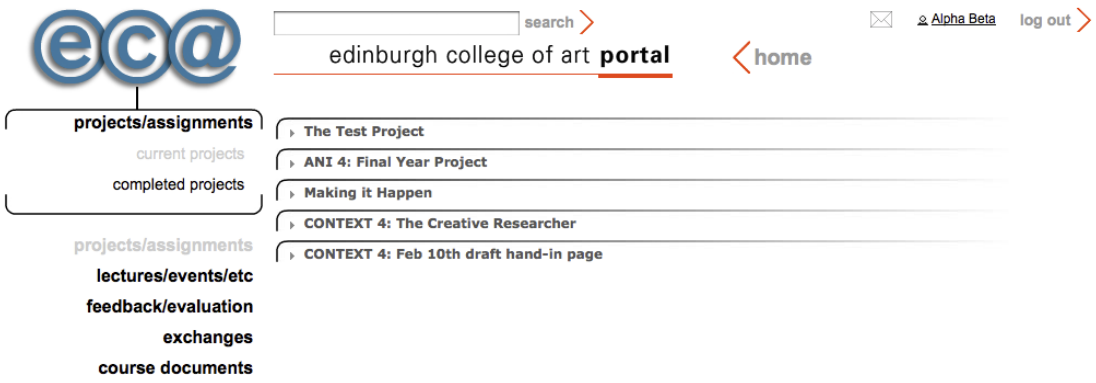

Figure 5. - Student's personal project view

Even without the assessment and feedback features, the use of this system to design, compile Figure 5. - Student's personal project view

and deliver project and assignment information ensures consistency and removes the risk of bits of paper being lost or suffering from perennial photocopying. The information is available to the student at any time from anywhere, and it begins to build a detailed record of the curriculum.

The self-evaluation date, usually just before the end of the project, begins the assessment dialogue for which the student shares responsibility with the staff. (Nicol, Macfarlane-Dick 2006) To enable self-evaluation, a single-screen interface presents the student with two text boxes: one to enter comments on their performance in the project and one to enter comments on the project itself. (This latter box can provide good information for staff for subsequent curriculum modifications or, for example, alert them to physical resource problems.) Next, the learning outcomes that are being assessed by the project are presented as a series of radio buttons, one for each grade letter, which the student uses to grade their performance. Documents can be uploaded and, in the case of visual studio projects, five images of the work. (The images are not intended for assessment purposes and are just an aide-mémoire for subsequent reference.) The student does not have to complete this process all at once, but can save as they go, submitting when they are done.

After the actual project work has been assessed by staff, a similar interface allows them to see the uploaded documents and images, and the student's comments (assuming they have been submitted), but not their grades. In the interests of neutrality and to remove possible influence, the initial setup of the system did not show staff any student data apart from the uploads, but this was changed in response to student feedback; the student comments below show that they correctly identified the resulting lack of aligned dialogue. The screen also provides a text box for feedback comments and a set of radio

buttons to record their assessment of the learning outcomes. Once all the students have been assessed and feedback 'written-up', the information is released to them all simultaneously; any students who have not submitted a self-evaluation will not see their feedback until they submit. The system then presents a 'side-by-side' view showing both student and staff comments and grades together, useful for subsequent 'face-to-face' discussions.

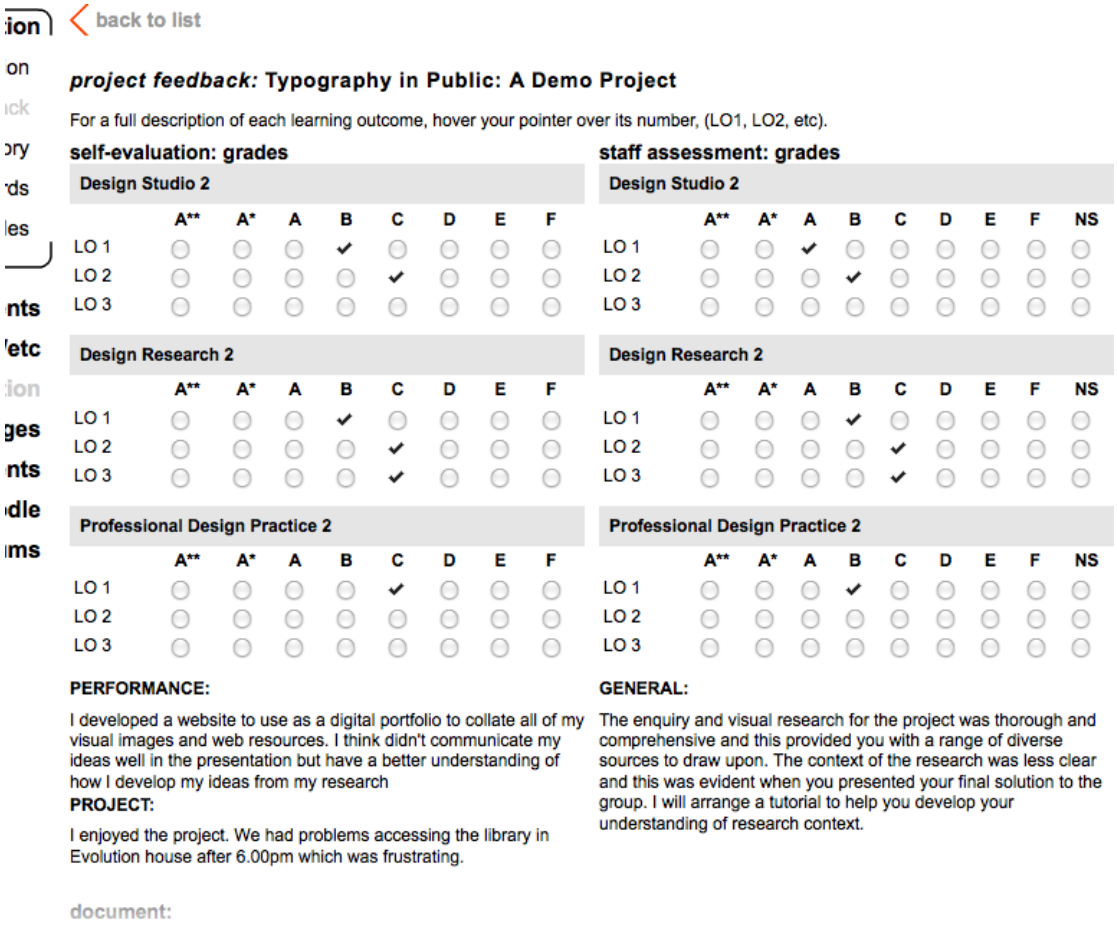

Figure 6. - Side-by-side post-assessment view

During such a discussion/tutorial the student is required to take notes, then use another feature of the system to generate a record of their understanding of what was said at the meeting. This record is submitted for checking to the tutors who were present at the discussion; if they are satisfied that the student has understood correctly, they can validate the record; if not they can add some clarifying/qualifying comments and if appropriate arrange for further guidance to be given; this feature was not implemented until late in the session. The student responses to the survey below, reflecting on the lack of this functionality reinforced our belief that this had to be an essential part of the

system, as it now is.

As a result of this, the student is fully involved along with the staff in the 'mutually constructed' assessment and feedback process: using the grading scheme and the learning outcomes in direct relation to their work; reflecting on their performance and the project itself; and compiling the record of 'face-to-face' feedback. This entire process is repeated several times during the academic session, depending on how many projects or assignments are undertaken, building a comprehensive profile of performance and written record of feedback and reflection over time.

A VALUABLE GENERATIVE SYSTEM

During the first academic session that the Learning Management System has been running in the School of Art and the School of Design, a very large volume of data has been generated and accumulated, almost as an unintended by-product. Since all the projects in these schools were delivered through the system, it is now possible to examine the entire curriculum for any given cohort. The thousands of student comments on the projects themselves and issues surrounding them provide important information on the potential for curriculum or environment improvements; the interchange of evaluative performance and feedback information between staff and students has generated invaluable reference data and a picture of the quality of communication from both staff and students is emerging.

Prior to the introduction of the system, and based on experience of the paper-based model that preceded it, doubt was expressed by some staff as to the likely level of participation by the students. This was unfounded. The character limit of 2000 was regularly reached and there were occasional calls for an increase. The benefits to the students of this word-limited additional analytical and critical writing, not about their subject but about their learning, should become evident at some point, however, the full analysis of this will only be possible after the system has been in operation for a few more sessions.

In contrast to the relatively high concordance between staff and students in the actual grades entered, it is revealing to examine the striking variations found in the texts in the student 'performance' and 'project' boxes, and the staff 'feedback' box. In terms of volume the content of each box varies from nothing, (yes, even from staff!) to the full character limit, with students frequently using the full amount. The variations in quality are almost as extreme, with some students failing to get beyond describing what they have done, and clearly not understanding the difference between the 'performance' and 'project' boxes, to others whose contributions are so perceptive and articulate that one would be tempted to hire them as tutors on the spot. More concerning is the variation in quality and style between staff. Here are a few examples:

1. 3rd Year Graphic Design Student - Performance:

> I relied a lot on documenting this project though taking photographs, as I was aware from the start when making my object that it would be dissolved and essentially disappear. Bearing this quite daunting fact in mind, I made sure that I documented each stage of the making process as I went along. Visiting the "Another World" surrealist exhibition at the Dean Gallery opened up my imagination to the wide possibilities of the project as I was able to appreciate the vast range of surrealist work. When it came to researching dreams themselves, I looked to my own experience of dreaming and sleep and analysed particular aspects which interested me. I also researched dreams more generally by browsing the internet, with particular attention to the structure of how we dream. To broaden my ideas, I also picked some magazines from the library at random and found one which focused on embroidery to be particularly interesting. To understand the background of the Surrealist movement, I referred to books from the library. I think that I have communicated the development of my final object effectively by documenting each step as I went. I could perhaps have communicated my ideas and research in more depth, as there always seems to be more going on in my head than there is in my sketchbook. I think that I came up with a good range of final images which work individually or as part of a series. However, with hindsight I should have spent more time presenting the final adverts "in situe" to better communicate the campaign as a whole. This project did challenge my thinking, as it involved multiple layers – the background of surrealism, the requirement to create an object of some sort, bearing in mind that the final result would be photographic, and incorporating the channel 4 identity. However, "thinking" tends to be my favourite part of a project, so I enjoyed the challenge, and think that the conceptual aspect of this project was my strongest point. I also enjoyed the opportunity to incorporate my interest in using fabric and embroidery. If repeating this project, I would push myself to be finished at an earlier stage so that there was more time for fine tuning. I'm very happy with what I have achieved in this project and think that I can see an improvement in my work, however I know there is definitely room for improvement and hope to exceed my own expectations in my next project.

Student - Project/Assignment:

> I particularly enjoyed the emphasis on conceptual thinking in this brief and enjoyed being actively encouraged to literally make something. The brief was very clear, and made it easy for me to break the project down into stages in my head. The project was just the right length - not too long, not too short and I think that any extra time that I would have liked to spend

could have been created by slightly different time management.

Staff:

Your work demonstrates your ability to initiate or respond to briefs. You are visualising and combining established concepts, often with sensitivity and maturity. Now you need to explore your ideas further and focus on their originality. Although you are trying different materials and techniques you need to challenge yourself more in this particular area, for example work at different scales or with different aspects of the concept. Try experimenting more with less regard to success or failure, expect to learn through a process of trial and error. From your work is clear to see that you get great satisfaction from the ideas and concepts you generate. Allow sufficient time at the end of projects to produce the final resolution, and ensure that this element isn't let down by your choice of materials or finishing skills. Ideas, concepts and directions which incorporate appropriate research are being explored and developed at the beginning of projects. You are questioning, analysing and annotating your work but you still need to broaden your research techniques. For the first 24 hours of a project resist from using the internet or library. Generate ideas based on your own knowledge first and then go and research them. To help you select the right idea to develop further in your studio work, you must first generate a more diverse range of concepts at the start of every project. Throw yourself a few challenges, and if necessary, bring three completely different ideas to initial pin-ups.

2. 4th Year Fashion Student - Performance:

I feel that there was a suitable amount of time given to us in order to complete the project.

Student - Project/Assignment:

I feel that the word amount given was appropriate.

Staff:

LO1: A large number of examples are discussed, but discussion of each is brief. Fewer examples, discussed in much greater detail and applying more than one critical source to help guide interpretation of the example would have helped to bring more rigour to the discussion. Missing narratives theories such as Barthes that may have helped provide framework for discussion.

LO2: A lot of time is devoted to describing the textile examples, rather than moving onto an analysis of how narrative on cloth may differ from text on paper. Narrative theory is used in a very limited way and much more could have been made of discussion of how narrative on cloth differs (both posi-

tive and negative) from other narrative strategies.

LO3: Must attribute information, such as the love stories in the V&A quilt to the source where you found this information. Referencing does not follow the Harvard format with large passages of information need to be much more clearly attributed to their original sources. Good structure. Lack of references could have been noted in intro, rather than mentioned late in paper, when it begins to feel a little like an excuse.

3. 1st Year Graphic Design Student - Performance:

During the studio stage of the Menagerie project, I not only combined my favourite aspects of my research and worked to a more practical artistic level; I changed the general idea of my piece entirely. Having settled assuredly on the theme of butterflies and portraying the four seasons within their wing patterns and textures, I instead decided to experiment along a route concerning a less sculptural and more linguistic idea. After discovering the words for the collective nouns of certain animals to be potentially humorous when drawn literally (for example, a 'coalition of cheetahs' or a 'band of coyotes'), I began to explore ways in which I could depict the creatures and their pun-inspired visual habitats. My time management here improved, because I became thoroughly engrossed by the intricate drawings and also used photocopying to save time and experiment with different techniques. I encountered problems here when applying paint onto a printed version of my drawing, but this helped me to conclude that I would work with colouring pencils when it came to the real final piece. An aspect of this stage that didn't go as well was when I realised that doing more than one final drawing would be almost impossible: having originally planned to do at least three as part of a sequence, I was forced to see that the detailed nature of my drawings would leave my only with the time to do one. Knowing this allowed me to pour effort into one eventual drawing, for which the composition, materials, characters and style had been effectively decided beforehand.

Student - Project/Assignment:

I appreciated the length of the brief because of the opportunity it provided for ample research, experimentation and creation of a worthy final piece. Having two weeks to experiment within studio space was helpful, but one disadvantage here was the lack of space within the studio to work. There were certain days where a desk was not available, which lessened the time that I could spend effectively working and developing my ideas.

Staff:

Matilda has started well with her sketch pad and info gathering.

4. 3rd Year Interior Design Student - Performance:

> I am in all happy with my portfolio this year. I feel I could have taken more of an interest in the exhibition design but it is not a subject I particularly enjoy and tend to fall away from this. I am aware I will not always get the chance to choose a project and I need to work on self motivation for projects I'm not particularly interested in. I loved the section project this year, where I designed the extreme sport learning centre. I feel I responded to brief well and knew what I wanted to do from an early stage. my sketchbook work lacks and I am aware I need to improve dramatically on this, especially for fourth year work!

Student - Project/Assignment:

Staff:

> final project the strongest out of the year, and shows real improvement

Variations of this sort undoubtedly existed when the assessment scheme was being delivered on paper, but because of the inaccessibility of the information, no action was taken to address it. The easy interrogation possible on the LMS presents us with an opportunity for further exploration and analysis, leading to more extensive development and explanation with both staff and students, not just about the system but the underlying pedagogical, assessment and feedback model it facilitates, and its relation to the 'face-to-face' world it is intended to support, not replace. Already an increase has been observed in the amount of informal discussion around assessment, feedback, learning outcomes, and our pedagogical practices in general following the introduction of the system.

THE SURVEYS

An online student survey about the portal, with specific sections on the LMS, was carried out and received 478 responses, about 25% of the total student population. From the survey response, the majority of students like the integrated Portal/LMS system finding it easier to manage information with everything in one place. Students using the system find the continuous access to a record of their grades and feedback useful. Having this information available online has clearly given students an additional mechanism to reflect on their progress and (mainly through reviewing staff feedback and grades) try to improve their performance:

> "I can see it when I want. I use the information to see where I should improve. I like to be reminded of how I have done and compare what I think of my work to what the staff think."
>
> *1st year Product Design*

> "I used the feedback before I go into a new step/project or when I feel stuck or confused with my current work."
>
> *2nd year Painting*

> "Having the feedback saved online is really helpful as you can go back at past comments to check progress and aim to improve upon it. It is also useful to see grades and comments in relation to the learning outcomes all in one place."
>
> *4th year Textiles*

A number of those students who do not currently use the LMS feedback and assessment system also expressed that, seeing its value, they are keen to do so.

Criticisms/concerns that emerged related to issues of 'face-to-face' feedback, self-assessment and staff/students dialogue. The feeling that online feedback should be supplementary to that supplied in person by staff is clear from the student survey response, as:

> "*feedback is more complex than just a written comment"* (1st year UG Design) and online feedback, "*lacks the possibility of productive discussion and of deep understanding*" (2nd year UG Design). Although students found having access to previous feedback online useful as a record they could refer back to, there was a marked concern that this could mean staff had less time to offer feedback in person or that online feedback would supersede valuable face-to-face interaction with their tutors.
>
> "It [online feedback] could be useful except that it seems to end up a poor substitute for actually having true feedback as in a verbal tutorial with the professor. I would prefer that it was used after the fact, that I have a tutorial and discuss with my tutor what I think about my project and then have the grades and comments posted so I can refer back to them."
>
> *2nd year PG Design*

Where students mentioned self-assessment, it was generally in a critical light. They did not understand the point of self-assessment, particularly as they did not feel that staff referred to their self-assessment comments or that they even looked at them, making it seem '*like an exercise'* rather than an integral part of the assessment process. (The potential for its use to students in terms of the comparison of self and staff evaluation to gauge their progress has not, thus far, been communicated well to students.)

A number of students said they felt it was a flaw in the system that there was no a way of responding to staff comments/marks (by asking further questions etc.). It is likely that this has had an impact on students not seeing the LMS as a two-way dialogue (only 19% felt they were engaged in a constructive dialogue with their tutors through the LMS and the majority felt communication with their tutors was lacking on the LMS).

> "I definitely do not feel that I am in a dialogue with my tutors - I was told that apparently the tutors can't see my feedback and I can't see theirs until we both submit. Then there is no further feedback on the portal. This means that neither of us are able to respond to each other's feedback - and often I am left feeling misunderstood and projects feeling unresolved."
>
> *2nd year UG Animation*

> "When starting new projects it's a help to go back and see areas that could have been weak that need improvement and constructive ways the tutors have suggested doing this. However, it's hard to know if the tutors read the students feedback on projects/their own work, meaning it's not a 'dialogue' as such, but rather a one-directional stream of information."
>
> *3rd year UG Fashion*

Similarly, although the online delivery of project briefs was generally praised (for its convenience and accessibility), students were critical of the reduced opportunity to ask questions, leading to possible misunderstandings in their articulation of briefs. In addition, there were multiple comments concerning the lateness of staff in releasing feedback and marks online, and the inconsistent quality of feedback across projects, which could also be a contributory factor to students feeling they were not sufficiently engaged in a dialogue.

> "Sometimes you just get marks and then a brief comment even if you have spent half an hour writing detailed answers to the self evaluation questions."
>
> *1st year Intermedia*

The language used to describe the *learning outcomes* remains an issue and when asked for ways to improve the LMS, a number of students criticised their language and commented that they should be made clearer and easier to understand:

> "The descriptions of learning outcomes etc are too vague and can be easily misinterpreted."
>
> *3rd year UG Film and TV*

> "The explanation for learning outcomes are very poetic and most of time need a thesaurus to interpret."
>
> *1st year UG Interior Design*

> "I still have no idea what all the various learning outcomes mean. The language is fairly obtuse."
>
> *4th year UG Fashion*

Following the student survey, a further set of questions were developed for a staff survey. 34 responses were received from academics, administrators and technical staff across the range of disciplines. From this early investigation into staff opinion on the portal indications are that it is an improvement on the previous system, in terms of its ease of use and efficiency. In terms of the LMS, there were concerns that providing online learning resources demotivates the students from broadening their research and seeking sources further afield.

SUMMARY AND CONCLUSIONS

Early indications are that, while positively received overall, areas for improvement are now identifiable. It is absolutely clear that within the context of the studio-based pedagogy used in art and design, students do not want any online system to replace the highly valued 'face-to-face' interactions with their tutors and peers. They value however the ability of the system to provide an online organisational framework (accessible 24/7) where they can create, reflect and maintain a historical record of their tutorials, feedback and assessments in addition to maintaining a digital portfolio (image and text) of their works; this is also an area that is being explored for further enhancement.

The first year of operation has provided insights to the diversity of practice and approach between students and tutors, and has for the first time captured a holistic oversight of the curriculum across the College. This has highlighted numerous examples of innovative practice in the design of projects and learning experiences, as well as inconsistencies in the quality of tutor / student interactions and supporting feedback. There is a clear benefit (to tutors) in asking students to self-evaluate and formatively grade themselves, in order to help them fully understand the meaning of learning outcomes and assessment criteria. But a significant amount of work needs to be undertaken to help students learn how to do this effectively and understand its purpose and value; interestingly, despite students indicating that they still do not fully understand what the learning outcomes mean, they nonetheless grade themselves very accurately.

From the student survey responses, the inconsistencies in practice in how tutorials are conducted confirms the view that the 'face-to-face' interactions and tutorial discourse needs to occur as part of the feedback process. When students receive written feedback in isolation, it is perceived as 'comment' on their work and not feedback. The 'mutually constructed feedback' model proposed satisfies the desire of students to engage directly with the process of receiving feedback, and importantly requires both the student to become part of constructing their own feedback, and the tutor to confirm the student's understanding.

Although there are many future developments that can, and will, be made to the LMS, it is already functioning more effectively in supporting assessment and feedback than previous attempts with generic VLEs. Both the student and staff uptake and usage of the LMS and Portal overall is substantial, whereas in the past the use of VLEs as an integral

part of studio-based learning was minimal.

Without the development of digital spaces to provide a framework to support learning and assessment online, the mutually interactive model of engaging students with feedback and assessment in a studio-based pedagogy would be logistically (and arguably financially) unsustainable.

The provision of online digital spaces now provides a facilitative environment for students and staff to engage effectively in developing meaningful feedback with mutual responsibility and with the potential to enhance and accelerate learning and understanding - watch this space!

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Balancing Learning in Organizations

Antti Katajainen

ABSTRACT

The thoughts and approaches shared in this paper are based on M.A thesis research of learning with social networks in organizations for Aalto University School of Art and Design in 2011. This paper investigates different ways of learning with knowledge sharing in organizations. It also provides a solution how to describe the most important quality criteria for learning and social networks.

Keywords: Different Ways of Learning, Organizational Learning, Tacit Knowledge, Virtual Communities, Social Software, Learning with Knowledge Sharing, Social Networks.

INTRODUCTION

The balance between informal, formal and social ways of learning varies naturally on the objective of an organization. Learning can be considered as the most valuable asset of an organization. By enabling different ways of learning organization enables sharing of skills and tacit knowledge effectively. A well build virtual community efficiently enriches ways of learning through a distributed network of people delivering diversity of opinions at one place. Additionally is also adaptable for the specific needs and goals for different organizational settings and goals. It also helps to keep information and knowledge up-to-date.

The new approach in virtual learning environments make the learning more accessible by enabling joint learning between colleagues and participants online. Different ways of learning can be seen as part as social, formal and informal activities. Around 80% of individual's learning is usually informal. Informal learning can be described as learning where the learner has set his or her own learning objectives. Formal learning can be seen as opposite to this, where someone else e.g. teacher or instructor sets the objective.

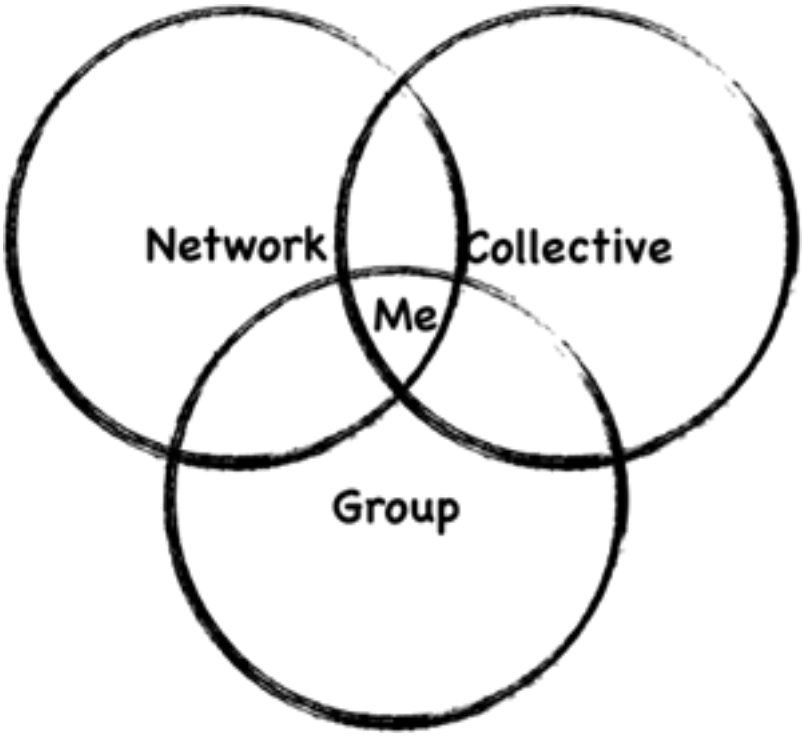
The amount of information is overwhelming for individual learners to adopt and process. For information seeking, problem solving and understanding complexity we need collaborative tools to support our ways of learning. Lack of recognizing the change in learning and learning environments can lead to bad decisions and inefficient processes. Online learning can enable and make information spread effectively by recommendations, automatic preferences, community tools and information filters. All of the above help learners focus on the most crucial and specified information needed for succeeding in every day work.

SOCIAL SOFTWARE AND DIFFERENT WAYS OF LEARNING IN ORGANIZATIONS.

Social software provides the necessary functionality to allow you to run your own social networking site, whether publicly or internally on a networked intranet. Social software is used widely for educational and business purposes. Social software can be a suitable solution for different ways of learning in an organization due to the following assumptions:

- It allows multiple ways of collaboration and information sharing.
- It supports a variety of web 2.0 tools that can be seen as part of higher order thinking skills and cognitive processes.
- It helps to keep content up-to-date and enables easy connecting and networking possibilities (digital objects, profiles, groups).

Jon Dron and Terry Anderson (1) explain the distinction between social software tools (Originally presented by Stutzman (2) and suites that are focused upon objects (object-centric) and upon people (ego-centric). They describe the differences by the following: “Object-centric sites allow users to share, comment up on, and display a wide range of digital media, such as photos, music, books owned or read, citations, or music recordings.



(1) The relationship between Groups, Networks and Collectives.

Ego-centric sites usually contain profiles, personal diary spaces (blogs), lists of friends, community discussions, and other tools that allow users to locate, work, and play with each other".

Actually successful software for different learning ways supports both social networking ways. Learning in a community needs both features of creating objects (links, news, tag clouds, pictures) and also social human relationship objects. The meaningful contextual relations with strong relationship capabilities make social software a suitable community tool for learning in organizations. In addition supporting of personal space social software supports usually forms of many. Dron and Anderson (1) identify three distinct kinds of the many: the Group, the Network and the Collective. Next figure shows the relationships between them.

Group is related in organizational setting as a specialized group where knowledge shared is not necessary shared with the whole community. It usually has a clear purpose and normally membership is needed to participate in the group. Networks enable ad-hoc creation of group networking. With software it can bring similar interests together by recommendations and filters in the community. This makes it easy to join them anytime. Dron and Anderson (1) define collectives characterized by software-meditated aggregation: they are not about connections, but instead are formed by grouping people and their largely independent activities into sets. Tag clouds are good examples of collectives where individually created information/link cloud leads us to a larger network of collectively created resources.

BALANCING DIFFERENT WAYS OF LEARNING IN ORGANIZATIONS

According to Hulkari (3) nowadays quality researches of education shifted more towards subjective approaches. On the subjective approach quality can be described only from the perspective of individual's experiences. The above-mentioned statement highlights the importance of situated, individualized and unique characteristics of learning. That is why learning with communities cannot be generalized. Learning here is seen always as a unique situation.

Discussions during the M.A thesis research with different companies and their employees representing fields of ICT, HR and Collaborative applications gave me a clear picture of how learning must be understood in the organizations. The nature of learning is mostly associated by knowledge sharing activities and the supportiveness of these activities. There is also a strong belief in organizations that learning is an abstract and immaterial concept. Learning in communities is mainly created by different social participations. Learning is highlighted as a situated process also in the learning approaches of John Seely (4) and George Siemens' Connectivism approach (5).

By using criteria defined from different learning approaches and theories, researches from International eCollaboration Journals on web knowledge communities (6) and Usability designing, there is a way to balance and define social software's suitability to

support different ways of learning. I have used the four following quality criteria for social software that support different ways of learning:

- Socialization, support of communication and collaborative processes.
- Web 2.0 tools to support the higher order thinking skills.
- Networking and solving complexity.
- Usability, support the ease of use.

Balance between different learning ways is difficult to predict and measure since learning occurs mostly in situated informal ways.

The right balance can be found from the most important quality points of learning ways in a particular system by analyzing the degrees of above mentioned quality criteria with end users/community members.

The newest approach of learning highlights importance of social and connection making which are strongly related to knowledge sharing activities. The importance of learning in organization is easily understood with the statements of Nonaka and Takeuchi (7) where tacit knowledge is the most valuable competitive asset of an organization. In order to adopt tacit knowledge different ways of learning must also be supported.

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Engaging Art and Design students using institutional online learning spaces

Tony Reeves

ABSTRACT

The growing incorporation of online technologies into course delivery presents new challenges for educators in terms of creating effective opportunities for collaboration. Although the rapid evolution of e-learning tools can often prove daunting to many tutors in Higher Education, many educators have concluded that blogs have the potential to be a 'transformational technology for teaching and learning' (Williams and Jacobs, 2004). It is also recognised that technologies enabling students to contribute information can influence the nature of their work, providing opportunities for social learning and the development of knowledge structures and online communities (Coyle, 2007; Herrington, Reeves, & Oliver, 2006).

However, the speed at which new collaborative learning tools are evolving presents a challenge for institutions in terms of the currency of in-house software provision. In the case of the University for the Creative Arts, a specialist arts institution, tutors and students often prefer the design and customisability of cloud-based Web 2.0 tools (Wordpress, Blogger, Facebook etc) to the institutional learning spaces available on the VLE (Blackboard). The use of cloud-based learning spaces also poses implications in terms of data storage, privacy and copyright that are not immediately evident to tutors and students.

This research project aimed to investigate the ways in which Blackboard blogs might enable groups of undergraduate Film students to collaborate and share their research while on campus and in the field. A further aim of using blogs to evidence student collaboration and research was to make the process of assessing the group work more transparent. Each group set out to research possible themes for a documentary film, with participants adding their findings to the group blog. Group members were then able to comment and discuss each other's findings, with the asynchrous, commentary nature of blogging facilitating the development of learning conversations around specific themes and ideas.

This project used an action research methodology with the intention that lessons learned could then be used to refine the activity for the next cohort of students. The research indicated that using secure blogs on the VLE provided an effective way to increase opportunities for collaboration, enabling students to communicate and develop ideas quickly and efficiently and enabling tutors to provide targeted, timely feedback. The statistics provided by the blogging tool made it possible for tutors to clearly see the level of engagement of each member of the group, improving the transparency of the assessment

process.

Keywords: collaboration, assessment, blogs, VLE, student learning

INTRODUCTION

There is little doubt that the use of Information Communication Technology (ICT) forms a key part of students' expectations (Ramsden, 2008). The use of Virtual Learning Environments (VLEs) in higher education institutions has become an accepted method of creating opportunities for e-learning, and by 2005 over 95% of Higher Education Institutions (HEIs) were identified as offering a VLE for use by their students and staff (Sharpe et al. 2006). However, more recently the availability of free, online collaborative technologies has brought into question the continued relevance of an intuitional online learning space as students begin to prefer Web 2.0 environments that offer increased options for personalisation and collaboration (Deepwell and Malik, 2008). The flexibility and usability of online tools such as Flickr, Facebook, Google Docs, Tumblr, Wordpress and Slideshare often surpass the collaborative tools that were once only available as part of a VLE, offering a multitude of ways to share ideas and information and develop online communities (Herrington et al, 2006); Conole and Alevizou, 2010). Catherall (2004) observes that the two primary functions of a VLE are to enable effective interaction between tutors and their students, and as a way to facilitate content distribution. All too often, however, the emphasis shifts away from effective interaction in favour of the latter function, with the VLE existing simply as an elaborate document store, containing a minimum of content and seemingly disconnected from a student's learning experience (Adamson and Plenderleith, 2008).

A recent report by the Online Learning Task Force (OLTF, 2011) proposed that developments in online learning should be driven by the need to meet students' expectations, with HEIs providing students with opportunities to engage in collaborative online work. Such expectations can prove challenging for some courses at the University for the Creative Arts, a HEI offering a wide range of creative, practice-based courses in the Art and Design sector, as it is not always evident how online technologies can be successfully embedded in the design and delivery of a course. Nevertheless, a recent internal survey revealed that the 57% of course areas on the VLE were being used communicate with students and make content available, with 21% of course areas containing interactive activities. Although the VLE cannot offer courses the same degree of stylistic personalisation as an external site such as Wordpress, nor match the social networking capabilities of Facebook, it does present the opportunity for students to engage in relevant interaction and collaboration within the direct context of the online learning environment created by their course.

This research aimed to evaluate the effectiveness of using VLE-hosted blogs at engaging students on the Film Production course in an online learning activity. Data was obtained through the use of a questionnaire to elicit both qualitative and quantitative

responses from students as to their perceptions of the benefits and challenges of the use of the VLE to support the activity.

2. BACKGROUND

There is growing body of research that confirms the pedagogical benefits of the use of blogs to support teaching and learning in higher education (Williams and Jacobs, 2004; Coyle, 2007; Herrington et al, 2006). The importance of interaction in facilitating student learning and the idea that we construct much of our own understanding socially by way of conversations with others (Brown, 2002) highlights the need to provide students with opportunities to engage in course-related discussion, and blogs provide a flexible method of recording information and interacting with other students and tutors. Brown proposes a pedagogical approach that focuses on enabling conversations around a topic that scaffold students' ability to construct their own understanding, thereby increasing opportunities to engage in non-formal learning (Eraut, 2000). The use of learning conversations as a way to enhance student learning is also the focus of much of Diana Laurillard's work, who argues that social motivation along with the desire to share your knowledge with your peers constitutes an important part of the learning process (Laurillard, 2008). The work of Di Jaegher and Di Paolo (2007, 2008) on 'participatory sensemaking' highlights the importance of the interactional process in the social construction of knowledge and of active engagement by the learner. Bransford et. al. (1999) also draw attention to the work of Palincsar and Brown (1984) and the importance of sense-making in knowledge environments as a means to help learners become more metacognitive when experiencing new information.

The preference or an institutional learning space over an external tool for the activity in this case study was informed by the need to provide a safe space for students to interact and discuss their ideas. Brown (2002) cites Dr. Ruth Simmons, head of Brown University, who believes that "the campus is a space – a safe space – to have intellectual quarrels". The use of VLE-based blogs would ensure that the online environment was as safe as the physical campus, with students' conversations visible only to each other and their tutors. Shea and Bidjerano (2009) observe that when students feel comfortable participating in online discussion they also report higher levels of cognitive presence, and providing a safe, non-threatening, online discursive space was therefore in important in order to ensure that the use of blogs did not impede students' learning.

Conducting the learning activity on the VLE aimed to maintain the consistency of students' learning experience by keeping them focused on an institutional learning space rather than an external site. The tutor had considered using Facebook due to its popularity amongst students, but in order to see students' work it would be necessary for the tutor to 'befriend' each student, and entering into students' personal online space was not deemed to be appropriate. A second option was to use cloud-based blogging tools such as Wordpress or Blogger; these tools had proved popular with a number of other courses at the university due to their ease of use and ability to take 'ownership' of the online

space by making change to the styling. This raised concerns over whether students would feel comfortable contributing to an online space that was potentially visible to the whole world, and also posed potential data security risks in that students would be creating assessed work on a platform over which the university had no control or ability to backup. The tutor also expressed concern at potentially having to manage a range of different tools in order to view students' work, negating any potential efficiency gains over paper-based submission.

Ensuring that the student can see the relevance of the VLE is therefore essential if its intended purpose is to enhance their learning experience, and this can be achieved through careful alignment of the teaching, learning and assessment activities (Eraut, 2000; Biggs, 2003). Informed by Biggs' concept of constructive alignment (Biggs, 2003), the tutor in this case study intended that much of the learning in this activity would come from providing students with a greater opportunity to construct their own meaning. Advances in learning theory now suggest a preference for active construction of knowledge by learners facilitated by high levels of learner involvement (Van Note Chism, 2006). Actively encouraging students to discuss their ideas and research with each other through the use of group blogs was therefore a key factor in this activity. Van Note Chism also draws attention to the importance of the social setting in influencing the level of learning that can take place. The high level of internet literacy amongst many of today's students suggests that they feel comfortable participating in an online environment, and the blogging activity made it possible for students to engage in group work at both a time and place where they felt most comfortable.

3. METHODOLOGY

The research examined an assessment task for 96 second year undergraduate students on a Film Production course. The primary assessment task for the course was for each group to create a short film on a topic of their choosing. Students were divided into nineteen groups, and in addition to the primary assessment task group members were required to submit evidence of the research and negotiations that had contributed toward the making of their film. In previous years students had presented their research in a paper-based journal format, but the tutor indicated his dissatisfaction with this method of evidencing work due to the large numbers of students and the difficulty in assessing accurately each student's contribution to the finished piece of work. The tutor was therefore keen to explore the potential for students to organise their work in an online environment in order to meet two pedagogical objectives: firstly to render the process of assessment more transparent and manageable and secondly to provide students with a space where they could communicate both on campus and on location.

The decision to use blogs to support student learning was informed by Chickering and Gamson's Seven Principles of Good Practice in Undergraduate Education (1991) due to the blogs' ability to facilitate student-tutor contact, cooperation amongst students, active learning and a means to provide prompt feedback. The majority of cloud-based Web 2.0

tools available (Facebook, Wordpress, Blogger etc.) permit online communication and collaboration; however, in selecting an appropriate learning tool to support the activity it was important that the tool did not impede the pedagogical objectives stated above. Laurillard (2008) argues that social motivation is a key driver in facilitating student learning, highlighting that the social and collaborative elements of her Conversational Framework are key to its effectiveness. An important aim of the blogging activity was therefore to encourage students to collaborate, discuss and negotiate their ideas, and it was hoped that enabling students to see the work of others in their group would provide sufficient motivation.

The linear, commentary nature of blogging met the tutor's needs by providing a transparent method of communication between all members of the course (Heinze and Proctor, 2004), and the use of an online blog for each group would provide a way for students to work collaboratively on their assessment task by promoting active learning through online discussion (Van Note Chism, 2006). The institutional VLE (Blackboard) offered a blogging tool that would enable students to work securely in groups and enable the tutor to see the contribution that each member had made to the discussion and research. Although it was not possible for students to personalise their blog, the tutor believed this to be less important than the advantages afforded by the institutional in terms of managing the assessment of the activity. A blog was subsequently created for each group within the course and each blog was set to be accessible to only group members and the tutors.

Salmon's Five Stage Model of E-Learning (2000) indicates that when facilitating an online activity it is good practice to provide participants with a welcome note and guidance on where to find technical support. A PDF guide and short introductory video were therefore created and posted in the course to welcome students and explain how to use the blog. The video also identified appropriate conventions when participating in an online activity such as avoiding the use of inappropriate language. For the ensuing fourteen-week period students then contributed information to their blog and engaged in asynchrous conversation by adding comments to posts made by other members of their group. At the end of the period, all students were asked to evaluate the activity by completing a short questionnaire comprising nine questions. Questions 1, 2 and 3 asked students to evaluate the effectiveness of the blogs at enabling them to engage in collaboration and group work, communicate with other group members and helping them to satisfy the assessment requirement for the module. The questions used a Likert scale ranging from 1 (not effective) to 6 (very effective). Questions 4, 5 and 6 asked students to evaluate the effectiveness of the blogs in facilitating teamwork and group discussion, understanding the importance of non-verbal communication and managing their learning. These questions also used a Likert scale as described above. The final three questions asked students to provide short answers detailing what they liked most about the use of blogs for the activity, what they liked least, and how they thought the use of blogs could be improved, although these qualitative responses were often used to elaborate on their

quantitative response to one or more of the first six questions.

4. PRELIMINARY FINDINGS

The responses obtained from the survey indicate that students generally perceived the use of blogs to have been effective in supporting their work for this module, with 64% of students rating the blogs as moderately to very effective. A study by Beetham (2010: 7) on the growing importance of digital literacies in graduate employability highlights the increasing difficulty in distinguishing between knowledge and communication along with the perception that "familiarity with Web 2.0 technologies opens up a completely new space for and style of learning". 56% of students believed that being obliged to organise their activities and communicate largely by way of the blog had helped them understand the importance of communicating electronically. But while it can be perceived as encouraging that the use of blogs provided students with an opportunity to explore non-verbal communication, a significant number of responses (44%) indicated that they were of little or no use. Further research is required to clarify whether this was due to a dislike of the functionality of the institutional blogs on the VLE or of the use of blogs in general to support online group work.

The data also indicated that 53% of students had found the blogs useful in managing their learning. Qualitative comments highlighted the usefulness of having all the group's research together in one place and of being able to refer back to comments made on earlier blog posts. The discursive nature of the blog also made it possible for students to track the progress of group members, enabling each student to construct a more coherent picture of the group's progress than would have been possible with a paper-based journal or workbook. However, the remaining 47% of students did not perceive the blog to have helped them manage their learning, and further evaluation is needed to establish how the blog might be evolved into a better learning management tool.

In addition to the student questionnaires, the tutor also provided verbal feedback on his experience of the activity. While acknowledging that the use of group blogs to evidence the individual contribution made by each student had enhanced the transparency of the assessment process, the tutor had found it too time-consuming to use the blogs as a means to deliver targeted feedback to the students. Some students indicated their dissatisfaction with the lack of interaction by the tutor on their blog and suggested that more engagement and formative feedback would have encouraged them to make greater use of the blogs.

5. DISCUSSION

Student perceptions of the effectiveness of the blogs as a tool for facilitating collaboration and group work

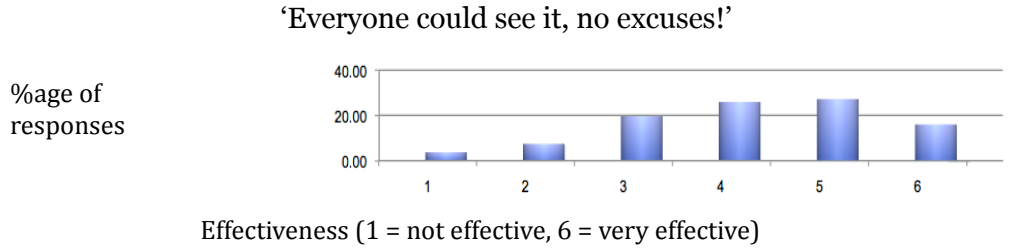

Figure 1:

How effective were the blogs at enabling students to collaborate and work in groups?

The data indicated that 69% of students were broadly supportive of the way in which the blogs had enabled them to collaborate with their group members. Several students commented that it was useful being able to see and track the work produced by their colleagues, and the digital nature of the blog made it easier to aggregate and share research and ideas than compiling a paper-based research folder. However a number of students commented that the functionality of the VLE impeded their group work with the design and layout of the page causing some confusion. Students also indicated that it was time consuming to have to log in to the VLE, locate and update their blog, and some expressed frustration at the unreliability of the VLE compared to a possible alternative collaboration tool such as Facebook.

Although 56% of students believed that the blog had helped them learn about teamwork and working in groups, 15% of responses indicated a strong disagreement. The qualitative data yielded few explanations as to why this might have been the case, with the majority of responses focusing instead on dissatisfaction with the functionality of the blogs.

Student perceptions of the blogs' effectiveness as a group communication tool

'It was a good way of communicating and monitoring everyone's work.'

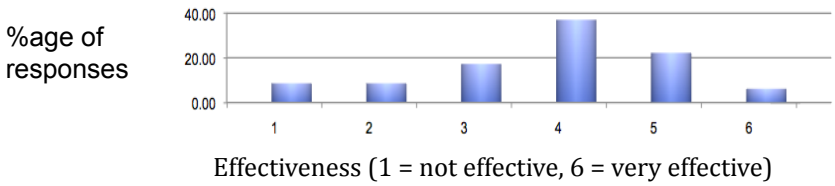

Figure 2.

How effective were the blogs at enabling you to communicate with your group members?

The majority of student responses (63%) indicated that the use of blogs had been helpful in enabling communication between group members. Laurillard (2008) indicates the power of a blog in turning a personal journal into a "broadcast production", and this is consistent with a number of students' comments that the group blog was a useful way to communicate and disseminate information to other members of their group. In addition, the qualitative data showed that the most popular aspect of the blogs was the transparency of communication brought about by being able to store the group's research in one place and discuss ideas with group members. The asynchrous, commentary nature of blogging made it possible for students to engage in learning conversations and discussion at a time convenient to them by adding their thoughts and comments to posts made by other members of the group. Students liked the ability to revisit previous discussions and ideas, and this would not have been possible to the same extent had these interactions not occurred in an online context.

However, the qualitative data also indicated that some students believed the use of an online communication tool had caused the group to arrange fewer face-to-face meetings, which had adversely affected communication. The lack of an email notification system to communicate new activity to group members was also the most unpopular aspect of the blogs, as students are used to this functionality from sites such as Facebook.

Student perceptions of the blogs' usefulness in helping them to meet the assessment requirement

> 'I most liked the ability of tutors being able to follow your progress and comment.'

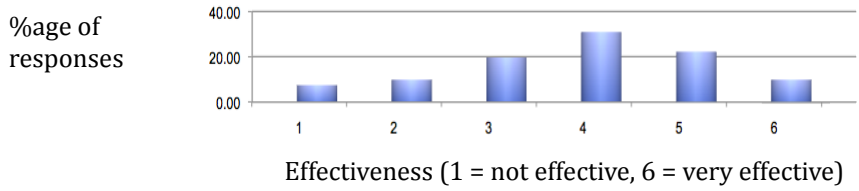

Figure 3.

How useful were the blogs at helping you meet the assessment requirement for this unit?

The data indicated that 62% of students perceived that the blog was useful in enabling them to meet the assessment requirement for the module. The ability to log all research including weblinks and other online resources for the tutor to see led some students to comment that they preferred the use of blogs to a paper-based journal as a means to collect and present evidence of their work.

However, the qualitative data also indicated that the blogs were potentially restrictive and did not enable students to provide evidence of all the work they had undertaken. Some students also expressed frustration at the functionality of the VLE and found it difficult to use the file-sharing facility to collate and organise documents. This suggests that further work is required in order to streamline the way in which the blog can be used to support assessment, and in enhancing the design and functionality of the VLE itself.

6. CONCLUSION

This case study has permitted an exploration of some of the issues surrounding the use of an institutional online learning space to support student learning. Focusing on the use of a blog has helped identify more clearly the ways in which the use of a VLE-based blog can enhance the interaction of students engaging in group work. This focus made it possible to identify three themes: student perception of the effectiveness of the blog as a collaborative tool, of its effectiveness as a communication tool and of its effectiveness in enabling students to meet the assessment requirement for the module. The research has been useful in clarifying both the benefits and challenges brought to student learning through the use of a VLE-based blog.

The majority of students reported that they were satisfied with the use of a blog to support their learning. As a learning tool, the group blog was perceived as a useful means of recording the activity and research of each group member and of providing a means to engage in discussion around this activity. Comments expressed by some students concerning the difficulty of navigating the institutional VLE were useful in identifying a number of functionality issues that need to be addressed if interactive, VLE-based learning activities are to be more successful.

When considering the question of whether or not the VLE is an appropriate platform for online collaboration, it is interesting to note the number of comments indicating that Facebook would be a better tool to support this activity. The implication of this is that students have no qualms about inviting tutors to view the contents of students' personal online space. While Facebook does indeed offer greater flexibility in its options for notifications (and more attractive overall design) it would be both interesting and useful to explore students' perceptions of the appropriateness of interacting with tutors on Facebook. If a goal of higher education is to educate students about digital literacies (Beetham, 2011) then this research suggests that further exploration of the appropriateness of a range of online learning spaces is required.

Comments from students about the low level of tutor engagement are consistent with research by Deepwell and Malik (2008) that learners have high expectations of the speed and amount of feedback that tutors are able to provide. At the start of the module the tutor had indicated his intention to add formative feedback to students' posts; however as the module progressed the quantity of information produced by students made it difficult for the tutor to monitor the blogs consistently. Garrison et al. (2010) highlight the growing belief that teaching presence is a significant factor in determining successful online learning, and this paper indicates that further guidance for tutors would be useful in helping them to manage an online learning activity.

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Learning space under construction: concepts for the change of media and communication in academic education

Christina Schwalbe, Torsten Meyer

ABSTRACT

The current changes in technology, media culture and hence communication inevitably also pose questions on their impact on formal and informal education.

Large parts of society have already made the transition and network media took over many areas of life. New forms of communication and cooperation emerge and new concepts of knowledge building and knowledge organization establish. Understandably, one would see Universities and schools at the core of this construction zone of learning culture.

Yet, universities and schools have grown and developed in the tradition of typographic and literary culture. Due to this and the recent far-reaching socio-technological changes, these former seats of learning seem more and more detached from present day media culture.

Taking this into consideration when thinking about the future of universities, one key question needs to be addressed: What is the role of learning spaces in education?, more precise: What are the demands of future learning spaces? and what are necessary alterations?

This is aggravated by the fact that a new digital mediosphere is so far only evolving and it's final impact will remain a mystery for one or two more decades at least. In history the change of the key media (e.g. letterpress printing, Gutenberg galaxy) had immense impact on educational institutions in their time and thus determined the general concept of education then. To keep track and to stay capable to (co-) design the change of media culture and learning culture, we need to face this interconnection as a fact and focus on the interplay of educational system and the key technologies of communication in our future learning spaces.

Keywords: Mediology, Medium, Education, Media Theory, Media Cultural History, Academic Education, Communication, Kommunikologie, Organisational Development.

In the year 2007 the project ePUSH started at the University of Hamburg. Within this project several concepts for necessary organizational, social and structural alterations of universities as learning spaces where developed in theory and practice. One central

aim of the project was to raise the students' and lecturers' awareness for the possible applications of digitally networked media for learning and teaching. In five sub-project different issues are addressed, such as the improvement of digital and technical infrastructures, community building in an academic context, the qualification of lecturers and tutors on the behalf of using the new medium, changing options and requirements for assessment and the construction of services to support teaching and research within a digital medium.

We would like to address basic matters concerning the digital future of universities based on the example of the project ePUSH. In the following we discuss how the current and the coming media-technological developments might influence the self-concept and the social organisations of educational institutions. Thinking about an appropriate concept of medium we start with the basic interconnections of media technologies and the educational system. Therefore we take a media-cultural-historical perspective, referencing the mediology according to Régis Debray. From this perspective we speculate about a digital mediosphere, mainly focusing on differentiations from the graphosphere. Combining Debray's mediology with Vilém Flusser's Kommunikologie leads to more concrete assumptions about the changing forms of knowledge communication and the social organisation of the universities as a learning space in a digital mediosphere.

MEDIA, CULTURE, EDUCATION

As already hinted at, the current changes and challenges for educational institutions are highly connected to media-technological and cultural developments. But this connection is not a new one that only came with the gradual entrance of computer and Internet to educational institutions. There has always been an essential interplay of media culture and learning culture on many different levels. Only if you try to understand this interconnection you can also understand the current challenges for the educational system.

The current debate on media and education is mainly based on a simplified understanding of media: talking about media very often means talking about the electronic, digitally-networked media. And even nearly 30 years after the arrival of the WWW as a networked and networking information and communication medium the term 'New Media' is still very common. Media in this context are reduced to electronic devices, that can and should be used to support the knowledge transfer in educational settings. From different perspectives the question is addressed, how these (new) media shall be taken into account in practice of teaching and what impact on learning processes is to be expected

From the perspective of media pedagogy, for example, these electronic media pose a challenge to the responsibilities of educators. Media pedagogy – at least in Germany – especially focuses on learning to deal with the (new) media in a reflected, critical way as well as to develop media literacy [1]. In this approach not only the technological level is considered but also media design, constitution and critic. Yet, cultural and structural

interrelations of media and education are not taken into account explicitly.

A more media-didactial approach, linked to the concept of 'eLearning', is more focused on the use of digital media as new channels for the knowledge transfer. Media-didactical work is often driven by the wish to enhance the performance of processes of learning and teaching. The concept of 'eLearning' emerged during the 'dotcom-era' in the 1990s, concurrently with the emergence of terms like eCash, eGovernment, eBusiness etc. The description of the (potentially) new options of communication and action emphasized the widening of traditional communication patterns with new electronically supported patterns. The 'e' added as a prefix to 'Learning' suggests, that now learning is also possible with electronic media – in addition to the 'normal' learning.

With the formation of the slogan of a Web 2.0, which implicates a versioning of the WWW, also a 'second version' of eLearning, so to speak 'eLearning 2.0' was proposed. While the WWW in its 'first version' was mainly seen as a distribution channel where information could also be stored and distributed digitally and not only using typographic media, the Web 2.0 evolved into an aggregation of interactive, participative applications – an thus into an active information and communication medium. The use of interactive and participative applications like, e.g, Wikis and Weblogs, is subsumed under the term eLearning 2.0 accordingly and thus finds its way into the media-didactical debates; but still, the term eLearning persist parallel to the normal learning, completed by the concept of computer-supported learning, which describes learning supported by electronic media and mediators.

However, the issue of the interconnection of media and education has to be addressed more as a basic principle. Strictly speaking learning processes always had been processes of media literacy development. Before the invention of the writing information and knowledge was transferred by word of mouth. As also the storage in the human memories was based on the spoken word, it was mainly necessary to learn how to handle the spoken word. Thus, in the ancient world learning essentially involved the art of rhetoric and of memorizing. On the other hand media literacy in a typographic culture involves the development of writing and reading skills and the critical exegesis of written text. In the current mediosphere skills for an operative handling of complexity are needed [2].

Just as learning processes cannot be seen isolated from literacy development, transmission media have always posed as means, medium, and mediators – and thus form the basis for processes of teaching and learning. Only the *nature* of these means and mediators, and therefore of the pedagogical media, has changed during the centuries. And in the same way also the practices of education and the organisation of settings of teaching and learning is permanently changing.

This leads to the conclusion that the debate about media and education should not only try to react to the technological development of media and to integrate new devices into the practice of teaching and learning. Moreover a fundamental interrelation and mutual dependency of media and education should be assumed which influences the

concept of education as well as the self-concept and the social organisation of educational institutions.

MEDIA AND MILIEU

To get into the interrelations of the educational system and media technology we have to think about the term "medium" first. The most basic definition of medium is "in-between". The medium is *in-between* sender and receiver. The medium is a kind of "transmitter" of information. It is a passive technical "tool" or "instrument" for the transmission and distribution of information. This would be the "weak", because harmless, understanding of media [3].

Much more interesting and much more adequate to the topics of our research is what Christoph Tholen calls the "strong" understanding of media. A medium should – beyond "transmitter" and "tool" – be understood as a constitutive activity of an "informational in-between". This would be a specific "milieu" or "ambience" that has some "shaping power". It is not something exterior, outside of the information and outside of you, something that you would simply not "turn on". The "strong" kind of medium is an environment or a milieu like water is a medium for the live of fishes. The "strong" kind of medium is a carrier, agent and matter of metal and of social processes. It's an embracing, enfolding instance – not something you can relate *to*, but something you have to relate *in*.

This kind of medium is double tracked. On the one hand the (strong) "medium" is defined in a highly abstract way according to systems theory as a set of conditions for cognitive, communicative and social processing – aka "culture". On the other hand – you will easily agree if you got in touch with presentation and preventability, in short with aesthetics – all cognitive, communicative and social processing that empirically happens in real life is addicted to the (weak) media as means of presentation und communication.

This means that the specific media culture is a socializing instance for every individual member of a social system. But the empiric usage of the media and the emerging cultural techniques as a whole form a "historical a priori" (Foucault) that is specific for each cultural epoch. This historical a priori which might now be understood as a media historical a priori also indicates the way knowledge is produced, stored and transmitted and – as Jean-Franciose Lyotard told us in his postmodern "Report on Knowledge" [4] it therefore indicates the status of knowledge and accordingly the definition of what is understood by knowledge.

The media historical a priori is a realm of possibilities. Like the medium water allows, enables, structures and forms specific possibilities of a fishes live, the cultural medium allows, enables, structures and forms specific possibilities of human communication, behaviour, and self-awareness. And – much more important – this is a blind spot in the human condition of perception and (re)cognition. You can't see that you cannot see there.

So from this point of view it's not (only) the technological means and matter that

change in a really fundamental way but the basic possibilities of human communication, behaviour, and self-awareness. The current evolution of the Internet shapes a new medium, a new realm of possibilities of human being.

MEDIOSPHERE

There is a method to investigate such media culture conditioned blind spots. Its inventor Régis Debray calls it "mediology": "Mediology would like to bring to light the function of medium in all its forms [...] It's a question of analyzing the "higher social functions" (religion, ideology, art, politics) in their relationship with the means and mediums/environments [milieux] of transmission and transport." Mediology is about the in-between [l'entre-deux], the "strong" medium, the "fuzzy zone" where technology and culture are interacting. It's about the "interferences between our technologies of memorizing, transmission, and displacement, on

the one hand, and our modes of belief, thought, and organization, on the other." [5] Debray defines the certain configuration of interaction between culture and technology we called "media historical a priori" as a "mediosphere". He identified (in his book written in 1999) three mediospheres – logosphere, graphosphere and videosphere, typified respectively by writing, print and audiovisual – and takes into account that according to the internet there might be a shift from the videosphere to a kind of "hypersphere" that consists of digital signals.

Maybe it's the best way of trying to understand the new digital mediosphere Debray calls "hypersphere" if we have a closer look at the graphosphere that shaped our culture according to Debray "until yesterday". Following Debrays very interesting matrix, which illuminates differences between the mediospheres across a range of aspects, we can see the progressive development of the human being as a learning subject. While the logosphere was coined by orally transmission and people who had mostly been passive receivers of information the "maxim for personal authority" changed from "God told me" to "I read it". The increasing transmission of printed information correlating with the more active engagement with written text now changed the understanding of learning and teaching. To learn now meant to learn to read and to learn to write. And to teach now meant to install reading and writing in the learners mind. In the typographic culture of the graphosphere the individual view of the world was not anymore "heard" by the spoken words of the "spiritual class" of that time: the "Church (prophets, clerics)". Now in the graphosphere it was a more self-generating or at least self-interpreting process based on the individual literacy and reading competence.

Michael Giesecke links the emergence of the modern academic culture to the evolution of a typographic culture [6]. According to Giesecke, the linear structure of the production and also of the transmission of knowledge in a typographic form allows for the reader of a book to follow the author's argumentation and thus to take his or her perspective. The reader can accept the point of view that is formulated in the text, be contrary

to it or continue the argumentation by referencing. Giesecke calls this form of communication social information processing without direct interaction. The modern concept of scholarship and thus the traditional structure and the self-concept of today's (European) universities is based on these structures of social information without direct interaction: Knowledge is criticized, accumulated and continuously developed. New knowledge is created on the basis of pre-existing knowlegde. The foundation of the university as an institution that combines research and teaching, based on the ideas of Wilhelm von Humboldt, took place during this epoch. At this moment the main function of the university was not anymore the transmission, distribution and storage of knowledge, but rather the production and the development of knowledge became a central issue. Production and creation of knowledge are intertwined. At the same time the option for social information processing without interaction widens the chronological range and thus significance of transmission. The educational aim at universities transformed from recapitulating the knowledge of scriptures, as focused on in the university of the logosphere, to the development of a critical way of scholarly comprehension within the book as a typographical medium.

LINE AND POINT, INDIVIDUAL AND NETWORK

We can still just guess, how a digital mediosphere will have developed. At the moment a shift can be observed in the interrelation of communication media, spreading information on a spatial level, and transmission media, bequeathing knowledge from one generation to the next. The relation of the ubiquity of communication and the historical range of transmission is becoming tenuous. The digital infrastructures expand the spatial and territorial reach, but the chronological reach is diminished. Had Debray described the form of time in the graphosphere as a line it is tending towards the point in the upcoming digital mediosphere [7]. Knowledge needs to be up-to-date and viable, it is more legitimated due to circumstances of practice than due to its suitability for eternity. The know-how is favoured over the eternal knowledge [8].

But not only the relation of time and space and the corresponding reach of knowledge are changing. There are also new forms of knowledge production and of cooperation arising. Especially the possibility of active participation on the Web encourages collaborative forms of knowledge organisation. Various applications, that act as distributors and allocators like, for example, social bookmarking sites like delicious, or also Twitter as a system of recommendation and a kind of dynamic, real-time search engine, provide access to the collectively organised knowledge and thus to a kind of collective intelligence. Instead of linearly organised accumulation of knowledge on the basis of interaction-free, social information processing, as described above in reference to Giesecke, the knowledge production thereby is based on a kind of collective intelligence, interacting in networked structures. The individual as knowledge creator is not the basic reference in this process. On the Net – and therefore in the public communication – the "wisdom of crowds" [9] seems to establish itself as a formative way of organizing and producing

knowledge. Thus it challenges the expert as educated individual, who was considered to be a legitimate reference for the validity of knowledge in the graphosphere.

Manfred Fassler refers to this trend towards networking structures and the disappearance of linear hierarchies in social organisation in his concept of "Communities of Project" [10]. A project in this context is a process of generating knowledge. The concept of knowledge in this case is not an absolute one but a relative form of human cognition. It is always bound to the temporary determining factors, is assigned by the project. Thus it is always related to specific scientific problems. Communities of project according to Fassler are results oriented temporary unions of people; the cooperating partners in such a community differ in their knowledge and competencies. They are always subjected to the process of devising and creating. Instead of division of work a mix of competencies is dominating. The cooperating individuality and the exchange of information and methods provide the basis Communities of Project work on. This cooperation and exchange is encouraged and accelerated by the digital generation and dissemination of information. Cooperation and exchange require active communication patterns of all members of a community. Being part of a network is the basic principle of cooperation.

University between graphosphere and hypersphere

Let's return to the initial question of the interrelation between media technology and educational system. The academic learning space and thus the learning culture is in large part shaped by the transmission media, as these are very much affecting communication and also social organisation. Universities and the modern academic culture have grown in the tradition of a typographic culture. This is reflected in the universities self-concept as well as in the organisational and communicative structures of educational settings. The current cultural change thus challenges universities as a whole and requires an active participation in the cultural transformation process. In the following, current transformations of educational settings and communication structures in teaching and learning shall be observed. The observations are related to the change of media, resulting in assumptions on the formation of a digital mediosphere and thus leading towards some proposals for the change of academic structures.

Following the argumentation from above, the current technological and social development is correlated to changing ways of communicating and processing information. In order to understand the current process and to act in a formative way we need to find models that help to describe and to analyse the structures of communication. In the 1970s Vilém Flusser established an academic field about human communication that he called "Kommunikologie". In a publication of the same title all his writings about structures and codes of communication were collected [11]. His eclectic research spanned the transformation of communication media from the cave painting over the emergence of typographic media until recent developments of ICT.

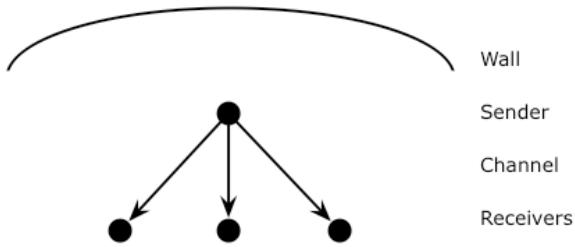
According to Flusser human communication is the process that constitutes the

storage, processing and dissemination of information, but also its generation. Like other models of communication, too, Flusser uses a highly formalised description of communication, split up into sender, information and receiver. The information is exchanged using specific (non-natural) codes and channels, both depending on the situation of communication.

His theory is based on the distinction between discourse and dialogue as two different forms of communication. The dialogue is characterized by the exchange of information between two persons aiming at synthesizing new information as a result of this exchange of information; in a discourse information is circulated and disseminated. The dissemination of information should be as exact as possible to enable the receivers to disseminate the information in their part. In this process the chance of loss of information due to its entropic nature can be much reduced, the information is saved. The change from being a recipient to become a new sender is called "progress" [12]. But there is always the danger of falsification – as the opposite of the truth of the information.

Discourse and dialogue are dependent on each other: in order to develop a dialogue, information is necessary; partners in a dialogue receive information in discourses. Or, the other way round, the information that is disseminated in a discourse had been generated in dialogues before. In total, Flusser differentiates between four models describing structures of discourse and two models describing structures of dialogue. The structure of communication is illustrated using the constitution of a theatre, a pyramid, a tree, an amphitheatre, a circle and a network [13]. Thus, he explains how people operate in different discursive and dialogic situations. Four of these six models shall be introduced that can be used as a basis to show present changes in structures of communication that are associated to the development of the current information and communication technologies.

Theatre discourse



Theatre discourse

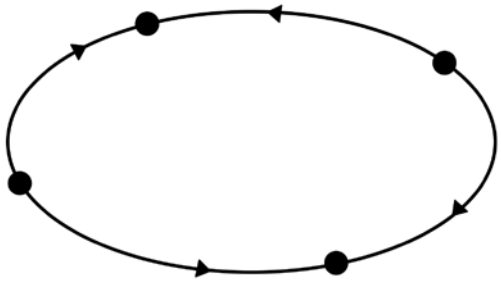
The characterizing element of the theatre discourse is the wall in the back of the sender, protecting the discourse against influences and disturbances from outside. As the receivers stand opposite to the sender in front of the wall, the whole concentration is

focussed on him.

The sender is the original memory of the information that shall be disseminated. In the first instance there is not much interaction between sender and receivers, but there can be a limited reaction from the receivers. A reversion from being a receiver to taking over the part of the sender or just interacting with the sender is possible. Flusser calls this reversion a “revolution” [14].

The theatre discourse is traditionally the form of an academic lecture. The role allocation correlates to the linear hierarchies of the graphosphere: the lecturer passes over his knowledge according to the one-to-many approach. Also many eLearning courses using closed platforms ore virtual classrooms for imparting knowledge can still be described by the theatre discourse.

Circle dialogue

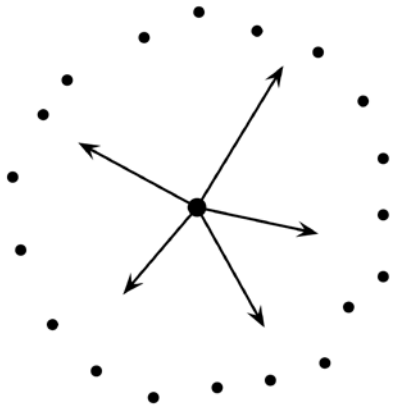


Circle dialogue

The circle is a model of a self-contained, dialogic form of communication where various existing bits of information are synthesized to new information. The memories involved in the dialogue do not just differ from each other regarding the information that is in the centre of the dialogue, but also regarding their competencies, the codes used in the dialogue and the level of consciousness. In the dialogue a common denominator of the information saved in the participating memories is searched for. As this common denominator had not been known to the participants before but is a synthesis of a variation of information there is new information generated in a dialogic process. According to Flusser, the self-contained character, determined by the closed circuit, is one main problem of a circle dialogue. It is a very elitist form of communication regarding the limitation of participants. Without openness to distractions from outside it is difficult to synthesize new information. The chance to synthesize new information depends on the internal differentiations: in complex structures with a high variety it is harder to achieve new information, but in case of success the quality of the new information is likely to be much higher.

Theatre discourse and circle dialogue are both self-contained and elitist forms of communication. The combination of both is symptomatic for the traditional teaching settings of a typographic culture. The possibilities of revolution allow for a theatre discourse to develop into a circle dialogue. Likewise a circle dialogue can be seen as a sequence of many little theatre discourse. Most academic seminars are based on this form of communication.

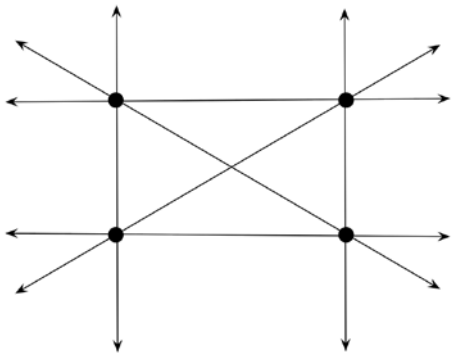
Amphitheatre discourse



Amphitheatre discourse

The amphitheatre discourse is originally related to the theatre discourse but differs significantly in structural modifications. In contrast to the theatre an amphitheatre discourse is characterised by illimitability and a "cosmic openness" [15], as there is no wall. The sender has no specific place and disseminates the information from his memory to a widespread audience via the broadcasting channels. Everybody can be a potential receiver but the receiving is rather arbitrary as it is only about to happen in case of an arbitrary adjustment of the receiver to the channel. In contrast to the theatre discourse this does not lead to a focused concentration but to unlimited dispersion. There is no contact between the sender and the receivers, nor are the receivers in touch with each other. The receivers are far away from the sender, nearly outside the discourse. There is nothing visible to the receivers but the channels the sender is using to disseminate the codified information. Neither the receivers nor the sender are up to interaction so that both sides prevent revolution and progress. Without the option of revolution and progress a dialogue is not possible. Examples for this discursive structure are mass media like the press, broadcasting services, television and static HTML-webpages, which dominated the WWW in the beginning. Also the transmission of knowledge via books can be seen as an amphitheatre discourse, as social information processing without direct interaction, as Giesecke [16] describes it.

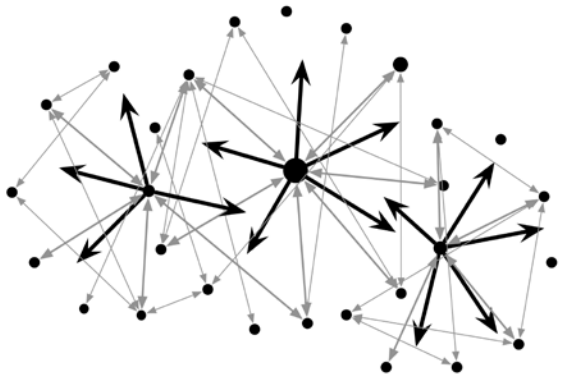
Net dialogue



Net dialogue

The structure of the net dialogue is contrary to the circle. While the circle is a closed system, the network is an open dialogic system where everybody can take part. Any participant can be seen as the centre of the dialogue. The communication in the structures of a network can go on without any regulation and open into every direction. Net dialogues are an extremely archaic form for communication that probably has already taken place in the first human societies in the form of gossip and rumours. These forms still exist today. According to Flusser, new information is generated through the transformation of information due to distraction. The net dialogue is a basic structure where all other structures are imbedded. All information is collected in a network but is transformed in the same time through side noise. This is what Flusser calls the public opinion.

Amphitheatre-Net



Synchronisation of amphitheatre discourse and net dialogue. Adaption of Flusser (C. Schwalbe).

One constitutive element of the evolving digital media sphere is the synchronisation

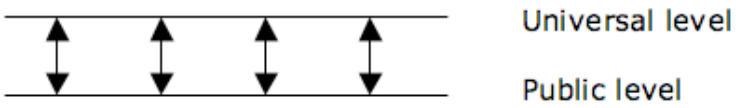
of amphitheatre discourse and net dialogue. This interrelation is not a new one, the ancient roman amphitheatres as well as today's massmedia have influenced the public opinion ever since. Yet, Flusser's assertions originate from a time before the Internet was established as a globally used communication medium and, consequential, prior to the development of web structures encouraging social interaction and participation in producing and dissemination of content. The broadcasting of information on the web via websites can, in the first instance, be taken as an amphitheatre discourse. There is no definite receiver of the sent information; the receiving depends on the receivers adjustment to the channel, he has to visit the website – or alternatively can use an RSS-Feed, which is also an adjustment to the channel. At first instance the receiver can only perceive the channel. But the options for interaction on the web allow for establishing contact with the sender. In return this enables the sender to start a dialogue. Another phenomena, that is characteristic for communication on the web is possibility for what Flusser calls "progress" [17]: The receivers can easily become senders themselves, disseminating the received information, again in the form of an amphitheatre discourse that is embedded in the net dialogue.

Educational institutions need to adapt to these evolving new communication structures. Imparting and generating knowledge in this cultural epoch is deacreasingly bound to universities, as it used to be in the graphosphere. Information and knowledge is available anywhere, anytime and – even more significant – can be made available anywhere, anytime and by anyone. That means, the transmission of ideas, information and knowledge is not anymore such an essential purpose of teaching. For the university teaching, aiming towards a reflective handling of knowledge and the understanding of processes of knowledge production, the imparting of meta-knowledge about the acquisition and the handling of knowledge and social-collaborative skills are gaining in importance. Education also means, with reference to Dirk Baecker, the training of a functional handling of complexity [18].

FROM LINEARITY TOWARDS NETWORKING

Digital network media currently infiltrate a still very closed learning space with linear hierarchies. This adumbrates a trend towards open dialogue also at universities. It seems, as if the transmission of knowledge is dissociating from the pedagogues role. Learning seems to more and more take place in open networking structures. That means, that not only the forms of communication but also the social structures and hierarchies are changing. Teachers still are regarded as experts, as caretakers of the significance of cultural knowledge in the teaching process. They either transmit their knowledge to the learners or act as mediators between the media as the technical storage of knowledge and the symbolic meaning of this stored information. The following schematic based on a model by Vilém Flusser, describes the social structures at universities that have grown in the tradition of the graphosphere. Different levels of communication are correlated in this model: The teachers as knowledge base or caretakers of knowledge respectively

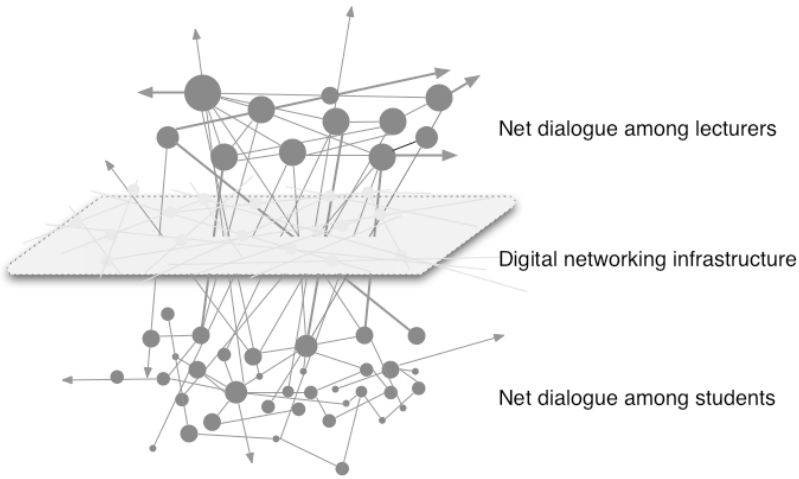
shall be assigned to the universal level while the students form the public level. The codes inside the universal level depend on the respective scientific field. Students shall learn these codes.



Levels of communication at universities

The communication between these two levels is still very much characterized on the one hand by the use of theatre discourses where information is passed over from the universal level to the public level and on the other hand by feedback in the form of circle dialogues [19]. Discourse as well as dialogue take places in the universal level. Yet, there are only limited scholarly dialogues on the public level; this means that there is no open dialogue among the students. There are clearly predetermined, linearily organised hierarchies in this form of communication, still shaping the academic learning space.

Yet, the adumbrating transition to a digital mediosphere holds changes of communication and transmission as well as changes of social organisation. Universities cannot opt out the process and try to hold fast to a long-serving system. The shift towards active, open communication patterns leads away from a communication structure mainly determined by the theatre discourse – with one central sender and many primarily passive receivers – in combination with circle dialogues integrating the feedback into the communication, towards a net dialogue where all members of the dialogue are active senders and receivers. The degradation of this discursive structure goes along with a flattening of the hierarchies.



Network communication at universities (C. Schwalbe)

The current developments accelerate options for feedback in form of the net dialogue between the universal level of the lecturers and the public level of the students, using digitally-networked infrastructure. At the same time, the net dialogue on the public level among the students is enhanced. There are also new possibilities evolving to connect discoursive and dialogic structures. New technologies provide more options for interaction. Feedback and dialogue between teachers and students is not anymore necessarily bound to institutional circle dialogues. And students can more easily act as senders to encourage dialogues - even independent from institutional organisation. The role of teachers needs to be redefined to prevent in particular that communication (the mere circulation of information in a global territory without imparting knowledge, ideas and cultural meanings from one generation to the next) is superseding transmission in the sense of handing down knowledge. A rethinking of the closed structures and the mainly discoursive communication in teaching settings is necessary. The transmission of knowledge needs to be replaced by the transmission of competencies to act in a complex, dynamic informational environment in a reflective way.

OPEN END

But not only the social structure and the structures of communication are changing. Also the technical infrastructures, the social organisation as a whole and the self-concept with the belonging symbolic meaning of educational institutions need to be redefined and redesigned, so that educational institutions can still play a role in the cultural transmission process also in a digital mediosphere. A changed status of knowledge as well as changed structures of cooperation, communication and transmission are essentially affecting the academic teaching and learning culture. The university as a learning space needs a new framing. To elaborate the form of this new framework was one important aim of the project ePUSH. A critical perspective on the reconstruction of the university was crucial for the projects success. Part of this critical perspective was the focus of research on the shift of the blind spot of thinking, knowing, realizing as previously described. Thus the characteristics of a digital mediosphere should be determined.

Next to this more humanist research ePUSH initiated a change process on different levels of the academic organisation. As discussed above it was one central part to foster open communication, cooperation and networking as additional patterns next to the still necessary self-contained and linear communication and transmission. For example the digital community platform "life"[1] was implemented to integrate the university as a space for transmission and discourse into the net dialogue of the web. At the same time several interfaces between digital and physical world were developed to support the easy and long-lasting connection to the digital infrastructures of the faculty and thus to the virtual space. The implementation of usable interfaces like e.g. terminals that are linked to the digital community "life" was accompanied by some strategies and measures that acted on a more hidden level and aimed on raising the students' and lecturers' awareness for the

1 http://life.uni-hamburg.de

meshing of digital and physical world and for the cultural change as a whole. One of these measures was the installation of a google maps marker in the virtual and in the physical world at the same place.

Google maps marker at the University of Hamburg

To sum up it can be said, that the project ePUSH was an experimental project which started with an open end, as it was (and still is not) clear, what the digital mediosphere would be like. A permanent meta-reflexion about the initiated reconstructions was necessary. The project results are based on the observation, that the digital mediosphere will be characterised by an always increasing openness and ongoing networking. But still, the outcome of this mediologic revolution is contingent so far....

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Digital Multi-User Interactive Systems to Enrich Socialization and the Learning Process: E-Learning Centres U. Porto

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ABSTRACT

This paper is the result of a research project promoted by the U. Porto and its Faculty of Architecture (FAUP) in 2006 that aimed the design and study of hybrid spatial environments: E-Learning Centres. The global aim of these spatial environments is to create a set of new dynamic learning spaces able to combine social interaction and diverse activities with studying and constitute, in this way, an important and strategic relational dimension for all the people that work or study in the U. Porto and to open university to its city.

The first E-Learning Café designed in U. Porto - E-Learning Café of Asprela - started to be used since 2008 and the positive results coming from monitoring and evaluating that space have encouraged university to continue to further develop and support this strategic research line of E-Learning Centres and their architectural design. In fact, these Learning Centres offer to the academic community a set of integrated environments where social and learning activities are combined and where the whole academic community can meet, exchange knowledge and share experiences, promoting in this way interdisciplinary work and innovation.

The new design of the E-Learning Café for Porto's Botanical Garden, presented also in this paper, is the result of the success of this research agenda that since 2006 was responsible for a set of interesting and significant studies about these themes and the construction and design of new dynamic learning spaces in U. Porto.

This paper starts with a state of the art review of diverse studies on similar programs and spaces, specifically the ones integrating digital multi-user interactive systems for social and learning activities. Then, it describes the most important results of the research undertaken since 2006, resuming the strategy applied for the E-Learning Café Asprela and the outcome of the study where we analysed the integration of the different interior spaces in relation to the users social behaviour. Next, the strategy for the design and upgrade of the new E-Learning Café in Botanical Garden is introduced and explained.

Finally, we present a collection of design proposals developed by our 3rd year CAAD students which communicate a set of innovative learning spaces, where interactive technologies are used to promote students learning engagement and socialization and have an active role for the proposed space configuration.

Keywords: learning centre, technologies, enriched learning spaces, digital multi-user interactive systems

THE IMPORTANCE OF THE PLACE, SPATIAL PRINCIPLES OF DESIGN IN LEARNING ACTIVITIES: A SHORT REVIEW

In recent years there has been a significant amount of debate regarding the importance of space and spatial design principles for learning. We can point out a few examples like: the "Designing Spaces for Effective Learning, guide for the 21st century" report by JISC exploring the relationship between space design and learning technologies; In the 2004 book by EDUCASE on the draft Learning Spaces; In 2005, EDUCASE Learning Initiative, focused on the informal design of learning spaces and studied design elements associated with the effectiveness of informal learning spaces, developing a guide for the design of diverse elements, assumptions and factors that contribute to the success when creating spaces for informal learning; the OECD-CELE project (Centre for Effective Learning Environments) began his studies in assessing the quality of teaching spaces in 2005.

One key aspect that has been gaining increased interest in the educational universe is that the learning process and its practice are understood to be taking place in other locations besides institutional educational spaces. In the book "Educating the Net Generation" (2005), Malcolm Brown defines as places of learning all the spaces where learning takes place, the real to the virtual classroom to the room "chat." In "Assessment: The Key to Creating Spaces That Promote Learning," Sawyer Hundley and Molly Schaller propose a series of criteria and a method for finding measurable factors to assess the complex interactions between universities, students, pedagogy, community, academic research, program planning and learning spaces. Philip and Holeton (Holeton and Long 2009) emphasize the importance of constantly monitoring and evaluating learning spaces. Finally, in Next Generation Learning Spaces Project by Carryck Institute for Teaching and Learning in higher Education project, which is focused on learning spaces, seeks to create a framework for guiding the design and operation of new learning spaces.

Herman Hertzberger (Hertzberger 2005) argues that spaces, in general, are more the product of collective appropriation of informal activities, given that this appropriation can transform the function or lack of function of places, giving them new meanings and other uses in result of the established interaction with users. All this changes the dynamics of those spaces and sustains the social and spatial importance of informal spaces. More than ever, learning nowadays happens outside the classrooms and classes timetables. With the increase in collaborative and group work, students are learning in small groups outside the classroom, using spaces that ease the interaction between them. ICT has had also a leading role in changing the learning spaces in many ways.

Scott Weber (Weber 2004) focuses on the relationships between pedagogical practices and the space properties from learning spaces distinguishing five basic types of transmission and acquisition of knowledge: a) delivering knowledge; b) applying knowledge; c)

creating knowledge; d) communicating knowledge; e) decision making. Continuing this work, Kenn Fisher (Fisher 2006) presents a model for the relationship between teaching practices and spatial conditions, identifying three types of zones indicating basics / alternative spatial configurations and furniture.

Schaller and Huley present a system for evaluating the physical learning spaces, exploring the relationship between learning and the characteristics of spaces (Schaller and Huley 2004). They relate and analyse information on learning satisfaction levels and occupation seeking to define the relationship between pedagogical innovations and learning spaces. In this study, they conclude that students tend to respond positively to environments that encourage interaction with the faculty and other students. Significant information that emerges from this study is that the physical characteristics of a space, its comfort and, above all, the possibility of customising or altering those spaces, are all extremely important, since they cause an emotional response that can encourage or discourage students from staying. Nerveless, the academic program that fosters the integration, the communication, the respect for the student and the innovation in time and space usage, attract and positively influence student learning. Through systematic analysis of photographs of the various learning spaces, Schaller and Huley conclude that students prefer individual work spaces without distractions or noise, natural lighting, good level of comfort, and a careful aesthetic image; at the same time, it was found that to work in group, furniture should be more informal, enabling the training in small groups from 4 to 6 people; in both areas, of individual work and group work, space should facilitate interpersonal communication, be controllable and promote the integration of basic needs and desires (such as eating/drinking and socializing) with learning activities requirements such as access to information by ITC.

Jos Boys (Boys 2011) states that it will be advantageous that learning spaces have the properties for quickly being able to adapt to the needs of users, so that students can change the space to fulfil the needs of academic work and socialization, that can be provided with the mobility of objects, as furniture, lighting and ICT. In situations where the design team understands the space as a dynamic model, they try to create a design that allows users, if they feel the need for it, to move and rearrange the objects and atmospheric features with sufficient freedom so that he or she feels comfortable and identified with the space they are in. A learning environment should contain spaces with flexible levels of privacy and be able to be manipulated by the user. Another important factor for the design of an efficient learning environment is to understand what are the key concepts and spatial elements for positively answering the program and guarantee that the physical representation of the learning space should be a reflection of the philosophy of the university. (Boys 2011)

Philip and Holeton emphasize the importance of constantly evaluating and monitoring learning spaces, which should be regularly “redesigned” by a multidisciplinary creative team. This project team should be well informed on many significant issues as emerging technologies, new strategies for the design of learning spaces and the recent

perspectives on science education.

Henry Sanoff presents a work focusing on learning spaces in "School Building Assessment Methods" (Sanoff 2001) where he proposes six variables to take into account for the spatial analysis of school buildings: Context, Massing, Interface, Way-finding, Social Space and Comfort. Sanoff argues that the architecture of the school environment can influence decisively the students' involvement in social activities, work and study, advocating that the existence of diverse spaces for students to socialize, within the school environment, will grow up immensely the potential for them to obtain higher performances. Sanoff's work is a very significant contribution to the studies that relate the space and the activities of teaching / learning, pointing out guidelines for the assessment and monitoring of spaces for teaching. Through his writings, the author argues that the organization of the spaces for teaching should consider the perceptual and cognitive mechanisms of the students - their spatial cognitive map. Thus, for Sanoff, it is essential to know how students move, orient and delimit its territory, in order to better understand how architecture can promote interaction between the user and space and, in this sense, between the student and the school.

In view of all this, we believe it is reasonable to admit that learning is an activity that will yield superior results if the environment where it takes place is a rich, dynamic and sustainable environment. In fact, as Whiteside refers "To create sustainable learning spaces, we must create community, take a holistic approach, use a common language, apply core pedagogical knowledge, and explore emerging technologies as a catalyst to engage faculty and students while we partner with others for pedagogy rich designs, assess learning in the new spaces, integrate ideas for Innovation, and revisit design methodologies." (Whiteside and Duin 2009)

In Linking Architecture and Education, Anne Taylor (Taylor 2008) makes an approach to the relation between learning theories and design principles. In her work Taylor gives us a set of important design guidelines for educational built environment including: design criteria informed by the users needs, architectural form, educational spaces that are flexible; learning landscapes and post-occupancy user guides and evaluation. She points out the changing of instructional delivery system of schools arguing that the past models must incorporate the impact of technology and the information highway on the use of space.

Within this context, we think that technology is not, exclusively, an attribute of contemporary architecture, but is inherent in its concept and has always been among its deepest concerns. In fact, nowadays, technology is no longer understood only as a tool to answer to specific problems, but as a reality in itself that is present in all areas of human activity. It has revolutionized our perception of space and of ourselves, assuming a central role in how we understand and relate with the world around us (Neto 2002, 1998).

It is really important nowadays to reflect on the impact of emerging digital technologies on the field of architecture. Besides other reasons, these studies contribute for

gaining consciousness about the appropriate operational capacity and authorship that architecture design should reflect and to uncover the potential of digital artefacts that we have now, exploring its influence on the design of interactive spaces.

In recent years, in the university context, there has been an emergence and affirmation of spaces created to host functions where study and informal learning are mixed with the dynamics of socialization where the ITC has an important role.

As examples that reflect some of the considerations and concerns expressed by the authors in the cited bibliography we can point out:

(1) Saltire Centre, Glasgow Caledonian University exploring the relation of learning between social and academic work promoting teamwork and informal collaborations. It offers a set of spaces to support different learning activities from individual work, to group work, socialization in a café, furniture and zoned areas to allow some enclosed space from the large open space. All the spaces served by wireless technologies and the possibility to access laptops and mobile devices improve students' needs for academic work.

(2) Queen Mary University Blizard Building in UK offering a set of flexible working environments for individual and small groups and a variety of breakout spaces, meeting and seminar spaces;

(3) Queensland University Interdisciplinary Learning Centres, with three building spaces, reflecting the evolution of understanding the link between space technologies and learning activities improving the use of ITC to focus on learning;

(4) Collaborative Learning Centre - University of Melbourne fostering collaborative approaches to teaching and learning, in the small and large collaborative teaching and learning spaces through the videoconferencing and access to grid rooms. With breakout zones designed and located so that there is a sense of enclosure without closing-off the space. Where different areas have a distinct identity through pattern colour and texture;

(5) Rolex Learning Centre of Ecole Polytechnique Fédérale (EPFL) in Lausanne, Switzerland - an entire building dedicated to learning activities with open-stack library, a 600-seat auditorium, places to study, and facilities for dining and socializing. The building constitutes an unique undulating space with no partitions or walls, by dispensing with opacity, the architects, SANAA created the perfect image of a space for learning, one fluid space where students and researchers from the school's various disciplines can socialize, circulate, study and interact with each other.

We could continuing with a set of interesting examples where space design

with the active integration of ITC meets learning, academic work and socialization needs in higher education: University of Newcastle, University of Otago, the Techno-Café in department of computer Science, University of Durham, Learning Grid, University of Warwick Telford College Edinburgh, Stanford University Integrated Learning Centre (ILC) in the Faculty Applied Sciences at Queen's University and many others.

Focusing our attention to Portugal, we can say that there are an increasing number of activities related to the quality of teaching spaces in Portugal: a clear example of this is Park School with the Modernization Program for the Secondary Park School. Among various actions highlighted recently in the International Seminar «Doing School», which focused on the theme of Architecture School, devoted to reflection on the learning space with the Herman Hertzberger contribution that shows the importance and concern for the relevance of the school's physical space and its quality housing for the success of the teaching-learning process.

Finally, it is important to mention that the U. Porto and its Faculty of Architecture (FAUP) are very interested in the study of spatial principles for designing spaces for learning activities with strong ITC integration and in their construction and architecture. This can be seen by the development of the research project that began in 2006 that aimed to design and study hybrid spatial environments: E-Learning Centres. The design, construction and evaluation of hybrid spatial environments - E-Learning Centres - in U. Porto constitutes a very important and strategic research program that aims to offer to the academic community a set of integrated environments, providing new spaces where social and learning activities are combined and where the whole academic community can meet, exchange knowledge, share experiences and work more effectively in groups, thus promoting interdisciplinary and innovation.

It can be said that in recent years, many things have changed within the learning world of universities and we have witnessed the emergence of learning spaces created to host diverse uses, where formal activities related to learning and studying are combined with the dynamics of socialization and where ITC has an important role. Within this context, the U. Porto and its Faculty of Architecture (FAUP) are very interested in the study of spatial principles for designing spaces for learning activities with strong ITC integration.

E-LEARNING CENTRES IN U. PORTO: ASPRELA AND BOTANICAL GARDEN

The design, building and evaluation of hybrid spatial environments - E-Learning Centres - in U. Porto constitutes a very important and strategic research program that aims to offer to the academic community a set of integrated environments, providing new spaces where social and learning activities are combined and where the whole academic community can meet, exchange knowledge, share experiences and work more effectively in groups, thus promoting interdisciplinary and innovation.

The U. Porto campus pretends to offer various types of learning spaces covered by technology within its boundaries: E-Learning Centres. The E-Learning Café of Pólo da Asprela and the E-Learning Café of Botanical Garden and their programs are important steps in that direction. The general objective is to promote different types of communication among the users of university facilities, using ICT as the best means to structure and organize the university space. This project created a set of new dynamic learning spaces that integrate social and study activities constituting a strategic relational dimension for all the people implicated in some way with U. Porto, as will be seen in next chapters.

E-Learning Centre of Asprela

The first E-Learning Café designed in U. Porto - E-Learning Café of Asprela - started to be used since 2008 and the positive results coming from monitoring and evaluating that space and its uses have encouraged university to continue to further develop and support this strategic research line of these E-Learning Centres and their architectural design to enrich socialization and the learning process that takes place within those spaces.

The E-Learning Café project took advantage of the open space configuration of the atrium, first floor room and double height ceiling areas of an already existing University building, which was being used erratically as a bar facility for students who were living in a nearby residential unit. Its program consists of four main interrelated spaces: Cafeteria / Bar, Multimedia room, Chill-out room and Work / study room.

One of the first objectives of this new design was to free the interior space of that building from all of its architectural noise as mismatched colours, textures and materials. The aim was to create a strong coherent and flexible spatial design, linked to the new E-Learning Café program. A new set of interrelated spaces, having each one of those places, an individual ambience and design reinforcing its particular purpose or use, and the adoption of solutions that assured easiness for users or programmers to change some characteristics or ambiences of those spaces. This last aspect was important because it gave a greater flexibility for the E-Learning Café space to be renovated, making possible for students to customise certain spaces and change ambiences without compromising the overall unity and architectural coherence of the global space. The different ambiences that are created for each area are mostly the result of thinking the new furniture and its layout as an important spatial design element for characterizing the space and by controlling the natural light and applying different types of artificial lighting to each individual area. The interior building signage is still being studied and the objective is to create a set of strong and clear orientation signs, well integrated in the proposed spatial design, allowing people to easily identify the way to the different spaces i.e. Cafeteria / Bar, Multimedia room, Chill-out room and Work / study room and emergency exits.

The possibility for students to fix, stick or place different letterings or artefacts on many of the walls allow them to appropriate the space with their own work and visual language. To facilitate this appropriation and individual characterization of the physical

environment we designed the walls and ceiling using white cork material. All of these components have high sound absorbency characteristics that allow to control the sound on the different spaces without having to use doors and therefore with no segmentation of the actual space.

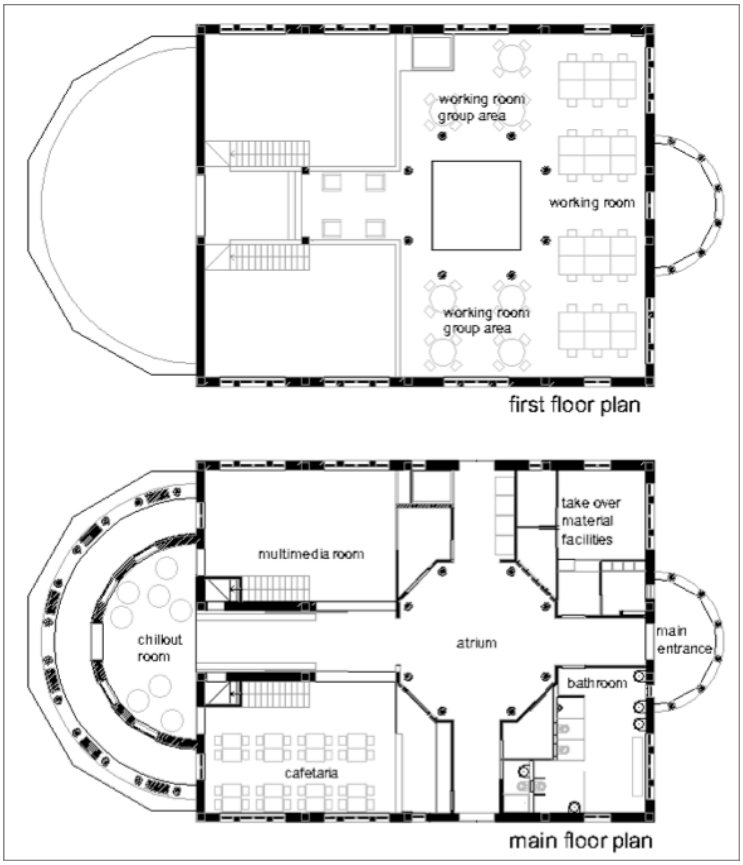

Figure 1: E-Learning Café of Asprela: main floor and first floor

Atrium, access and circulation space

The building has four main entries and we propose a new design for the door openings to match the rest of the building frames', creating a more unified exterior image. Nevertheless, the exterior of the building does not really suffer any change being just subject to some restoration and maintenance work.

Access to the second floor is through two symmetrical stairs positioned on the first floor near the West entrance that gives access to an open garden space. The different spaces on the first floor distribute themselves around a central octagonal atrium. This central area, equipped with some puffs and a multimedia kiosk, links the different ambiences of the rooms and serves as an entrance and distribution hall for the E-Learning Café. We propose, for the ground level, a homogeneous floor covering material in grey, which is resistant and easily washable. This neutral surface colour simultaneously gives unity, reinforcing the fluidity of the E-Learning Café space, and serves as a background for the different furniture and elements of the other rooms. A new suspended plaster ceiling is applied and we propose also the design of a new door in the West wing corridor entrance and a new set of shelves with two small niches to place a set of vending machines for food and drinks. The access and circulation space has as its most important reference the atrium, which is the central area with double ceiling height and natural lighting and the place where the four corridors that give access to the main entries of the building intersect.

All the space is accessible to people with motor difficulties, and for that it was found a solution of an elevator platform that links the first and the second floor

Figure 2: Atrium

Cafeteria / Bar

The bar is located on the first floor left West side and has two main areas: (a) the preparation of food and attendance vicinity and (b) the sitting area located where the ceiling is double height. The bar relates directly with the other informal working areas of this floor, encouraging the use of these spaces both for socializing and studying activities.

In order to create a feeling of shelter in the bar area that has a double height ceiling, we decided to change its scale perception, making the place less visually exposed from the upper floor by placing a set of overhead pendant lights, at the height of about 2,5 meters from the floor. This "rain" of pendent lights fills the volume of space in this very large room and is visually 'draw down' its high ceiling and help to define and delineate the bar zone, adding a certain intimacy to it. The green colour was chosen for the table furniture thinking on its tranquilizing and calm properties so important for people to relax. The walls, as was already pointed out, allow for students to personalize them with graphic material or other type of information.

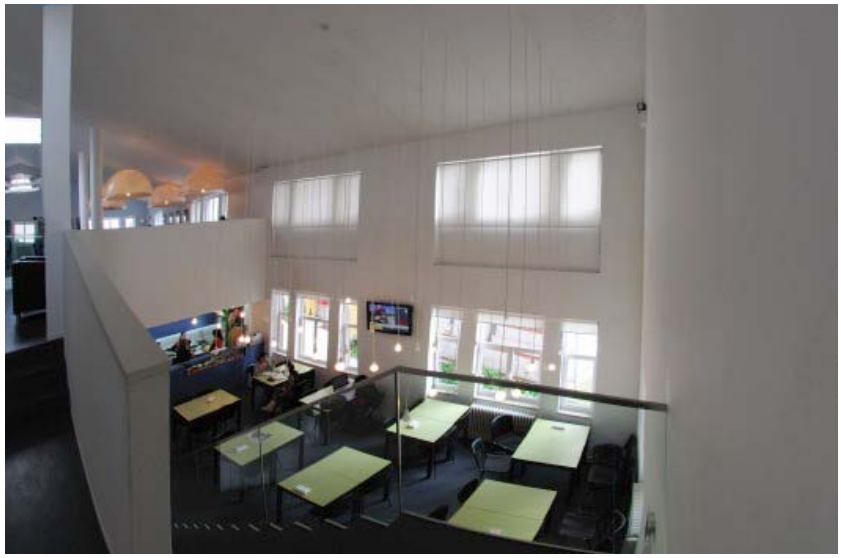

Figure 3: Cafeteria

Multimedia room

This multifunctional space, located on the first floor right West side, has also a double height ceiling and was designed to be the heart of all the performances and activities taking place in E-Learning Café that aim to animate and give a strong dynamic to this place. The objective is to manipulate the natural and artificial light in conjunction with the use of ICT for creating different ambiences and allowing several types of interaction with the people using the place. The pavement is made of the same resistant, washable neutral grey material so that light colours may be projected on top of it and as a result different ambiences are created. The first installation is an interactive web camera that captures the movement of people and sends a signal for different light colours to be projected in the walls and floor.

When no performance is taking place, a set of informal movable furniture for socializing activities or studying are setting in, assuring that this area will be always in use and integrated with the different studying areas of the E-Learning Café.

Figure 4: Multimedia room

Chill-out room

The objective is to use this South located half moon room both as an informal setting for relaxed and calm socialization and for studying. This strategic area is linked to the bar and multimedia rooms and serves as a transitional zone between the garden outside and the inside area of the building. The room has a tiled covered floor in a resistant and textured material; a white plaster ceiling and its wall surfaces allow students to customise them. The furniture for this room consists of a set of sitting pillows and small table furniture for working with laptops. In this way, we give a great freedom for users to organize and locate themselves both inside the building or outside in the garden.

Figure 5: Chill-out room

Working room

The working room area occupies the second floor and it is an open space designed to allow a set of different ambience / facility settings: an area with fixed computers distributed longitudinally in rectangular tables for individual work and an area for group work with circular tables topped by suspended acoustic lump domes and other more informal and less specific places.

The lighting and colours of the furniture characterize differently these two ambiences. Thus the fixed computers area for individual work is characterized predominantly by the blue colour and table lamps to give light in each individual table allowing the user to control at his will the light intensity. The working group area adopted orange to signal its different use and to obtain a higher diffusion of the light from the domes. The blue chromatic characteristics were thought as good for calming the mind and giving concentration and orange was believed to stimulate students, triggering their motivation for group work.

Figure 6: Working room

E-Learning Café: Study, Evaluation and Methodologies Applied

As we all know, every analytical method has its strengths and weaknesses, thus the choice among which to choose depends mostly on the characteristics of the problem we wish to find an answer, the objects that need to be studied and the characteristics of the investigation itself. Accordingly, we decided that the best choice was to have a blend of different methods for retrieving and processing data because this allowed choosing the most appropriate method accordingly to the topic and problem being addressed.

The analytic instruments that were used had as base the literature and experience related to evaluating the physical learning spaces (Schaller and Huley 2004) and applying a post occupation evaluation methodology in teaching environments (Sannof 2001) and the Space Syntax representation and analysis methods (Hillier and Hanson 1984, 1987). Applying these analytical methods for studying the building's different uses and perceptions, allows us to identify, within reasonable confidence, the morphologic rules and the functional changes occurred during its use, identifying compatibility / incompatibility factors between certain spatial properties and how those interiors are used.

The post occupation evaluation method is an important analytic tool that allows the tracking and evaluation in a systematic way the performance of diverse programs and built environment. The singularity of this evaluation technique is the inclusion of the user itself in the analysis process (Ornstein 1995), allowing through the evaluation of technical, functional, economic, aesthetical and behavioural aspects of the environment, to diagnose specific aspects of the spaces and its different uses.

The Space Syntax theory was first mentioned in the University College of London, Cambridge, and it has a peculiar way of representing the space, in order to systemize the information intended to gather, from concepts considered fundamental to the comprehension of different spatial characteristics. This theory supports the idea that space and its configuration have a great influence on the processes and social relations that occur when those spaces are inhabited and used (Hillier and Hanson 1984, 1987). Buildings aim to supply the required structure to support human activity, which are bound to a certain social organization and, in that sense, aren't unique and separated structures, but hold a global social organization right from the beginning of their design conception. Several authors believe that to understand effectively how architectural and urban spaces can influence our lives and the way we interact and function in them we need to analyse the morphological laws of the spaces (Hillier and Hanson 1984).

With the experience and the results obtained until now with this research focused on socialization and learning spaces with strong ICT integration, we can say, in general terms, that articulated and flexible spaces able to manage different uses are of paramount importance for encouraging strong interchange of ideas and diverse social interaction within a learning environment. (Neto et al 2009) (Neto et al 2007).

In fact, as was pointed out in the POE questionnaires, the overall impression of the

E-Learning Café space was considered, with a high percentage, Good and Very Good in relation to being a stimulating ambient in respect to its space variety, flexibility and strong identity (see table 2). These results are significant for this study, besides other reasons, because they confirm the important principles that literature review pointed out as important characteristics for the architecture of rich learning and socializing spaces.

Also, a very important result was the high percentage of students who considered the E-Learning Café spaces good and very good for Socialization, Individual Study, Group Study and Cultural activities (see table 1). Again, these types of uses that obtained so good results are also considered of paramount importance for building a rich learning and study ambience supporting a community of inquiry.

	Capacity of space to promote:			
	Socialization between students (%)	Individual study and academic work (%)	Group study and academic work (%)(%)	Cultural activities (%)
Very bad	0	0	0	0
Bad	0	0	1,3	0
Neither good or bad	14,3	23,4	3,9	28,6
Good	**64,9**	**49,4**	**50,6**	**45,5**
Very good	**15,6**	**22,1**	**39,0**	**20,8**
Missing System	5,2	2,6	5,2	5,2

Table 1: User's opinion for the space capacity to promote socialization, study and work (%)

type of use	% of observations in each space					
	atrium	cafetaria	multimedia room	chillout room	group working room	working room
studing allone	14	72	29	30	20	81
studing in group	26	21	67	67	76	18
socializing	60	7	4	3	4	1

Table 2: Type of uses observed in the space (%)

In relation to the results obtained with the space syntax methodology, the following conclusions seemed to be of paramount importance. In the first place, that the spaces more integrated favour a system with intense and informal interfaces – the atrium and corridors - and that these spaces are a potential factor for the effective learning and studying performance. This is so because they are break-out-spaces that allow students to meet and group together in discussion of ideas in/between the other spaces that are used for more specific, academic and concentrated studies or work – individual work and group work rooms or even the chill out room. Thus, they constitute spaces that connect with and aggregate the other rooms and are used simultaneously for reloading students´ mental energies by relaxation and social interaction. This mental reloading is even more obvious when break-out-spaces connect with and aggregate rooms with traditional configuration layouts that give little possibility for group work interaction or free interchange of ideas between students, something that still happens in many universities or departments.

It is important to emphasis again the importance of existing break-out-spaces: (1) that offer high levels of integration and connectivity, (2) that are strategically positioned in order to efficiently aggregate around them other rooms/spaces and (3) simultaneously allow and encourage group and social interaction – reloading mental energies and encouraging socialization. It is these aspects that support and reinforce a Community of Inquiry based on cultivating the intellect not only through scholarship, but also by socialization and free exchange of ideas, as well as critical, ethical, and creative thinking, dialogue and action.

The results of the last questionnaire made to collect the opinion of users in respect to how they use the space shows that students are in a general way satisfied with the E-Learning Café cultural activities program (~17% evaluated, cultural activities program in E-Learning Café as very good, and ~34% as good, ~35% as neither good or bad) and they also say, generally, that the E-Learning Café spaces are good for promoting the gathering of groups for cultural activities (-21% evaluated as very good, ~46% evaluated as good, ~30% as neither god or bad, 0% as bad or very bad).

The results on the evaluation of this E-Learning Centre obtained until now are very significant and confirm the important principles that literature review pointed out as important characteristics for the architecture of rich learning and socializing spaces. In fact, with the experience and the results obtained until now with this E-Learning Centre of Asprela, we can say, in general terms, that articulated and flexible spaces able to manage different uses are of paramount importance for encouraging strong interchange of ideas and diverse social interaction within a learning environment. (Neto et al 2009) (Neto et al 2007).

Accordingly, U. Porto as a higher institution concerned with the quality of their learning facilities took the redesign of this E-Learning Centre as a priority, especially after 2 years of its outstanding results (Neto et al 2010) (Vieira et al 2009) (Neto et al 2008), (Neto et al 2007). It can be said that the E-Learning Café is now a place of reference for all the academic community. The interaction and the personal enrichment are the base of all the activities developed and as will be seen next, with the new proposed design for its exterior gardens, this program will be even more consolidated and enriched.

Extending the Potential of Digital Multi-User Interactive Systems for the Outer Space of an E-Learning Centre: Architectural Design for the Arrangement and Design of Outer Space Garden of E-Learning Café of Asprela of U. Porto

The increased number of students using E-Learning Café of Asprela encouraged us to design a new program for the outer space of the building. The new proposal, U-thinking, aims to provide a solution of a coverage area, located on the back patio of the building making possible to use the garden for studying, working and for cultural activities regarding the arrangement of all the outdoor space surrounding the building.

The space is divided into two main areas protected with an innovative and distinctive coverage. Thus, at floor level we have two zones: a “more conventional” working/studding area with chairs and tables next to a more informal comfortable zone where a granite bench defines the space that can shelter some cushions and “bean bags” for more informal study and socialising area.

Partially covering the studding area, we designed an inflatable cloud that helps shelter and to define the space, its structure provides the necessary shade and protection from the humidity, solving also the problem of night lighting. The interior light can be emitted in a system of LED, allowing this space to be used at night.

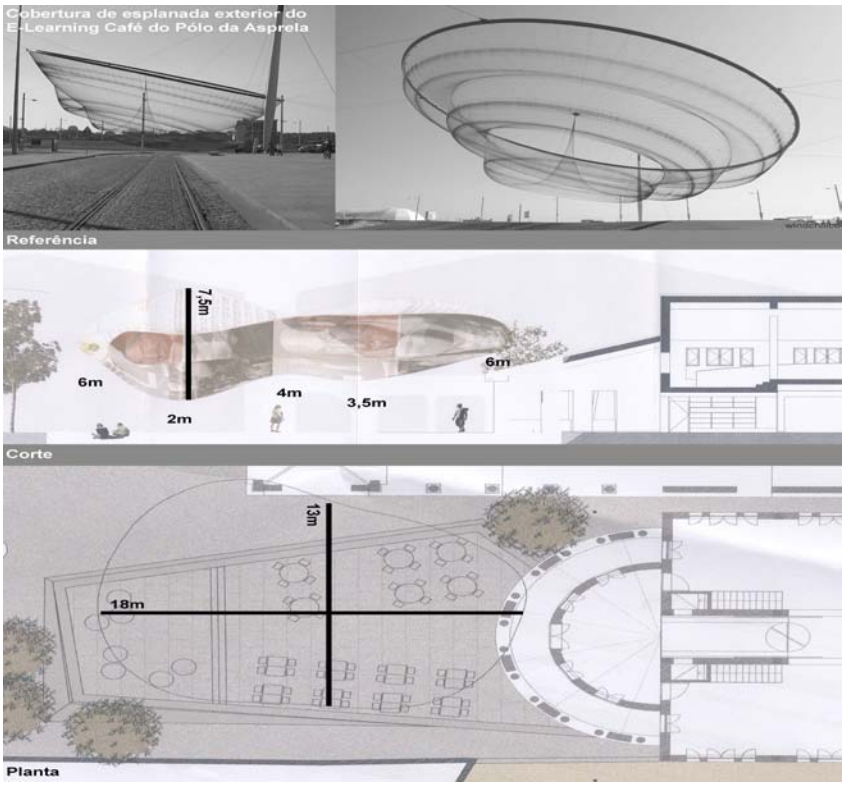

Figure 7: Section and plan of design project proposal for the outer space of E-Learning Café of Asprela

Figure 8: Simulation of the design project proposal for the outer space of E-Learning Café

Figure 9: Simulation of the design project proposal for the outer space of E-Learning Café

One of our formal references for the cloud structure came from cartoons, since they typically represent someone's thoughts in a form of a cloud. Thus we adopted the form of a cloud for our structure, which symbolises the materialization of everyone's thoughts. The interior of this structure can be illuminated whenever necessary showing on its surface dispersed phrases, thoughts or famous formulas considered to have been a mark of knowledge in the past. The inflated membrane of the cloud is also inspired on the traditional illuminated balloon of our traditional popular festivities of S. João do Porto. The iconography of the cloud shape representing the thoughts in the cartoons is, in fact, an allusion to the great thinkers and urges students to idealize.

The technology embedded in the coverage structure will also allow projections of artistic interventions as well the implementation of interactive digital artefacts for reproducing for example the concentration of students in the space, the weather conditions or the state of emotions of users.

Figure 10: Cloud concept of the architectural design proposal

E-Learning Centre for the Botanical Garden of the City of Porto: The Program and its Design

The design of the E-Learning Café for the Botanical Garden of the city of Porto was another important output coming from the E-Learning Centres in U. Porto research project and is the result of the upgrading and transformation of Salabert House located inside the Botanical Garden, which constitutes an important public space and architectonic equipment that strongly characterizes the architectonic and literary identity of Porto. Within this context, the architectural design proposal is paying special attention to the genius loci of this place proposing the reconstruction of Salabert house to its original volume and typology and a new extension building.

Figure 11: The E-Learning Café in the Botanical Garden: site

Figure 12: The E-Learning Café in the Botanical Garden: plan

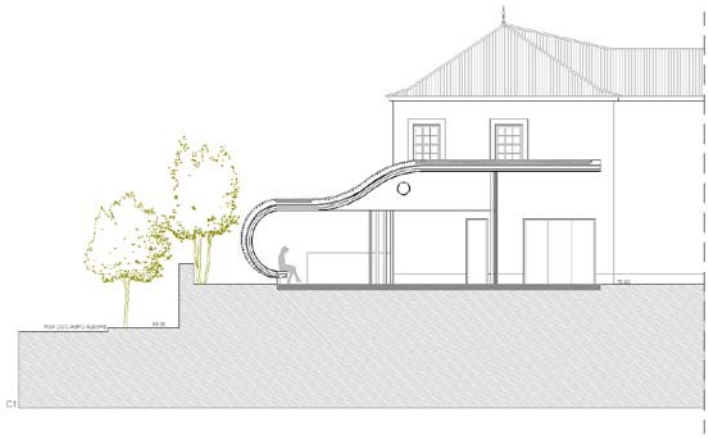

Figure 13: The E-Learning Café in the Botanical Garden: section

The proposed design for this new E-Learning Café will contemplate, in addition to the diverse learning and socializing spaces, other spaces for integrated activities that are known to balance the learning process and ensure regular healthy routines (informal learning spaces, multifunctional spaces, flexible spaces capable of adapting to different needs, spaces for music and sport activities related to students posture and relaxation). The program for the ground floor areas in the Salabert House contains the more public

spaces: cafeteria / bar and break out spaces, and in the upstairs floor the space is distributed among working group room and individual working room areas.

The new building will have a reception area where there will be dynamic data on for communicating interactively information related to the continuous monitoring and real-time occupation and programming of the E-Learning Café. Next to this "open space" area, we find the "chill out" room that will allow the implementation of collaborative projects and a significant interaction with technological artefacts, this area will also have specific technology with a design focused on body position, correct working postures and allowing high levels of performance and comfort.

Figure 14: The flexible space on E-Learning Café in the Botanical Garden

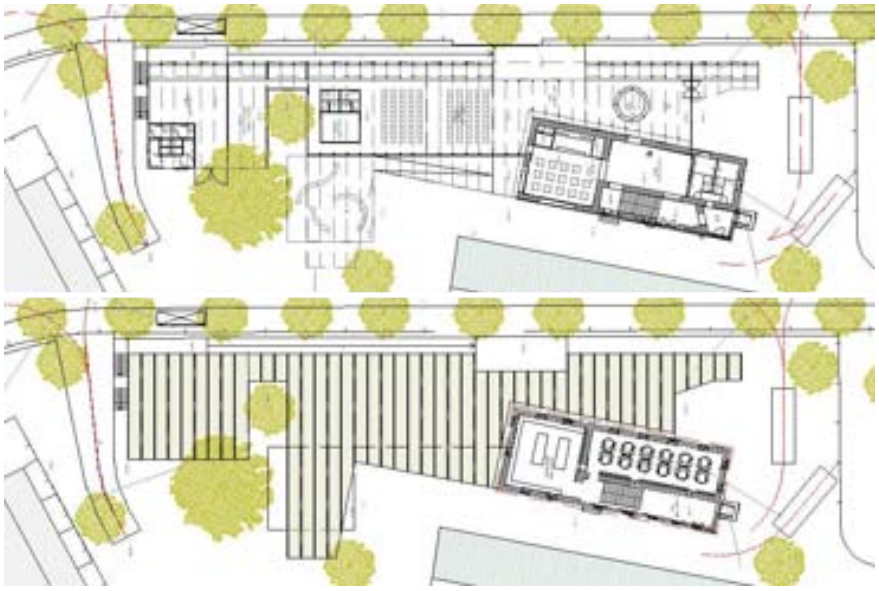

Figure 15: The E-Learning Café in the Botanical Garden: main floor and first floor plans

In addition to laptops for students and wireless connection, there are also small projectors which can be used anywhere within all the building. For the larger space, which is thought for the activities of larger groups, there will be a system of projectors, cameras and microphones able to be controlled by computer software that will serve the cultural and academic events that may take place and allow diverse interactive games and activities. We are also thinking in using the electronic communication system similar to the one utilised at the University of Strathclyde. In this new E-Learning Centre the interactive technologies will be present in many of its spaces, and may be temporarily used to change the perception of users / participants in relation to these spaces. Such initiatives, which interpret the individual's behaviour, provide a better awareness of the person itself and her place in the group and space environment. For this reason, they can improve the communication and interaction among the users of those spaces.

ACADEMIC ARCHITECTURAL DESIGN PROJECTS FOR AN E-LEARNING CENTRE

The program of the architectural design project for the CAAD course in FAUP is an E-Learning Centre, and students are encouraged to discuss significant architectural issues related to the design of these programs and also to question the role of digital artefacts integrated in these spaces.

The students´ proposals for the digital interactive artefact resulted in a diversified set of solutions, both at the level of the global formalization of the whole E-Learning Centre building and of its spatial characterization. We list next a selection of the students´ proposals showing the most interesting and imaginative ideas for integrating interactive digital artefacts in E-Learning Centre:

1) The digital interactive artefacts are in the facades that change their expression/ colour with the weather conditions in order to bounce back some of the constraints that result from adverse conditions. Other interactions in the facades are the ones located in the courtyard area where diverse information/images concerning the different activities that were programmed to be held for the E-Learning Centre are projected interactively. In this way, people are actively informed of activities that are presently running or programmed for the near future and also have the chance to be able to tell what goes on in the building and what other users are doing.

2) In an E-learning Centre building based on the idea of a journey, the students propose an interactive xylophone as the main digital artefact. The interactive xylophone should produce sounds reflecting users passing by the central atrium. At every hour interval, the music produced would be changed, to avoid the interactions to become too repetitive or boring.

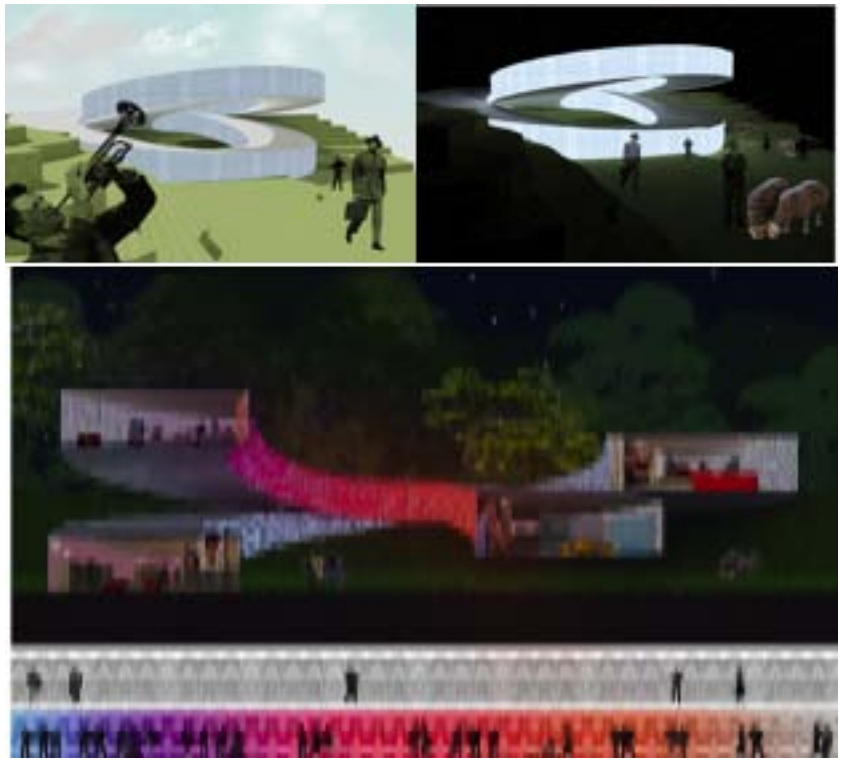

Figure 16: The E-Learning Centre "Ar2" design by CAAD students.

3) A very interesting project where an outdoor patio plays an important role as the entrance in the building. Students had the idea of placing an interactive digital artefact in this area to improve the socialization between the users of that space. While the information about the activities of the E-learning Centre are displayed to users in the exterior walls, the students shadows are also projected in the walls and function as "avatars" in an interactive way that relates to each person and its movement. The artefact improves the qualities of the patio, expanding its potential uses beyond circulation and access needs, transforming it into an important place for different actions and strong socialization end interaction with the building.

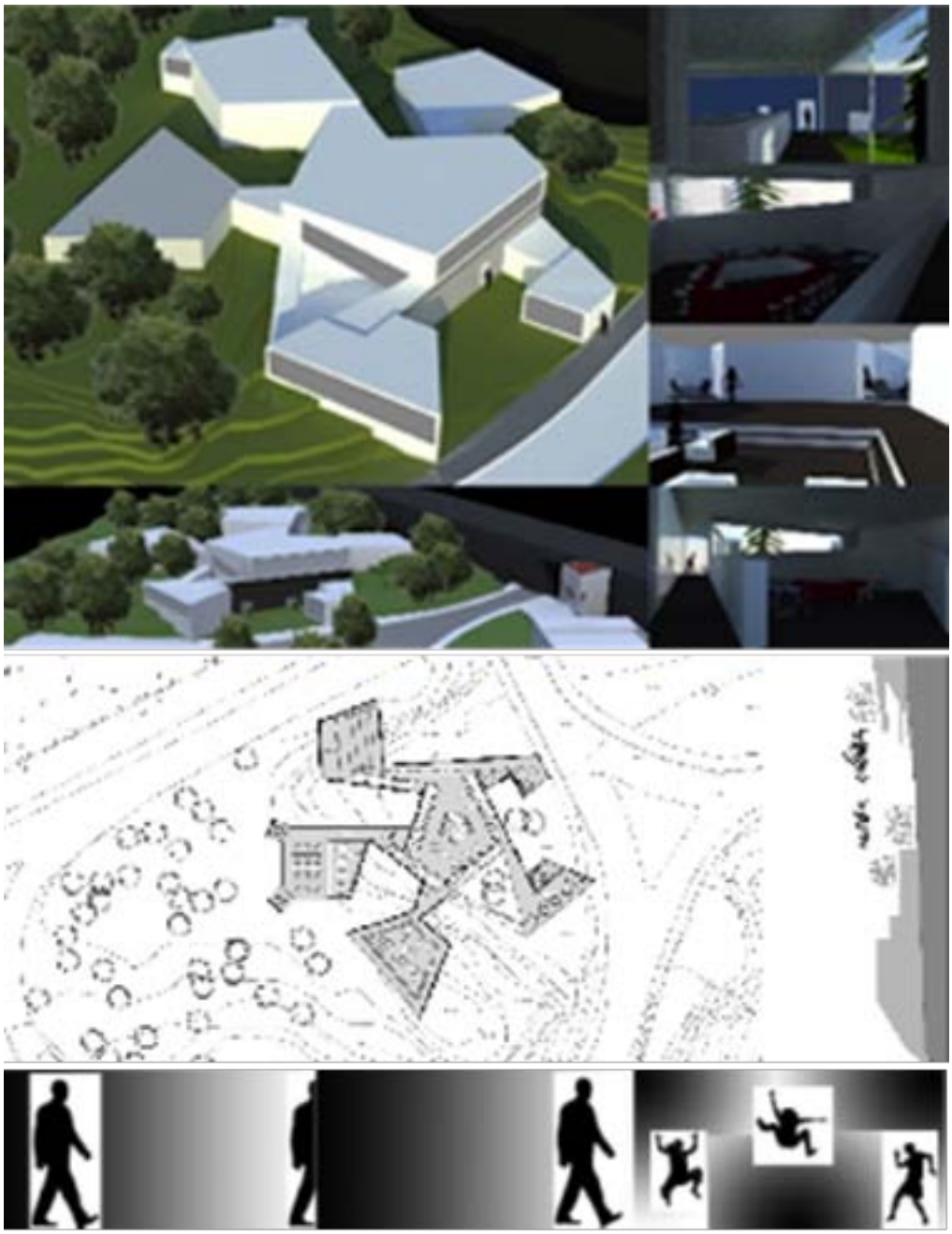

Figure 17: The E-Learning Centre "Atomic Café" design by CAAD students

4) An E-learning Centre building that has at its core an "empty space", which is a central courtyard that serves as a terrace area allowing users who are located in different places of the entire building to have visual contact between them. CAAD students pro-

posed that the walls of this space should be cylindrical and used for projecting videos and images communicating interactively the diverse cultural activities that are taking place in the city of Porto, especially in the various faculties of U. Porto (exhibitions, movies, theatres, conferences, etc.). These projections, on the wall surrounding the courtyard, can be observed from all points of the building.

Figure 18: The E-Learning Centre "E-Noodle" design by CAAD students.

5) In an E-Learning Centre where the theme "Lego" is the main concept for its design, the proposed digital artefact is entirely related to this idea and the proposed colour game pieces and movement are very connected to the technologic solution proposed. This meant that CAAD students chose to include in this "Lego" E-Learning Centre motion sensors, which are used in the transition of spaces, for establishing relationships between colour, space, movement and the diverse mind states or moods of the users. Interactive walls, applied in the atrium and in the "Lego room", are capable to establish an interactive digital relationship with the user's playing "Lego".

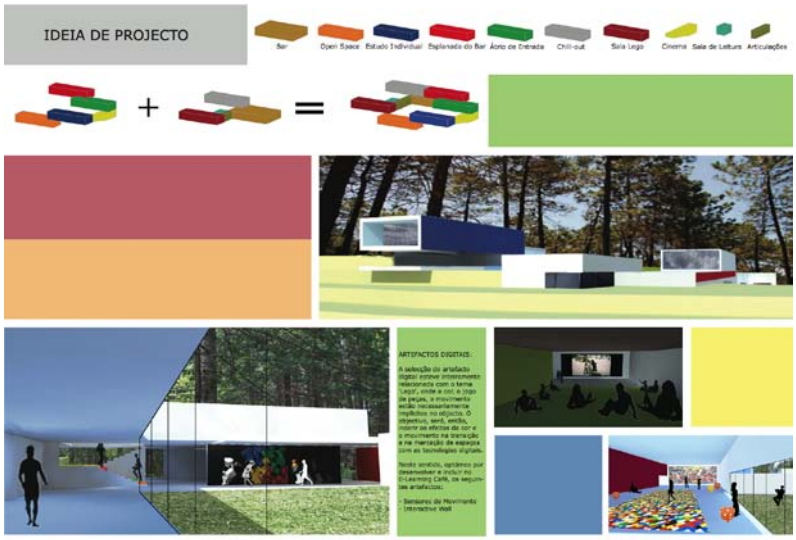

Figure 19: The E-Learning Centre "Lego" design by CAAD students

6) To improve the socialization between users in the circulation areas of the proposed E-Learning Centre, students imagined a digital artefact along the galleries and corridors of the building able to project their shadow on the glass when they are passing through that space. If two, or more people pass by at the same time and if there is no communication between them, then an image of shadows colliding is projected in the window glass, signifying lack of communication and socialization. When a relationship is established between the users that are passing by, the projected shadows on the glass are joined. In situations of greater action and movement, the artefact projects some balls falling down, signifying exaltation and socialization. Students also planned the use of holograms and sounds/music triggered by specific sensors to help people with learning difficulties.

Figure 20: The interactive artefact scheme from E-Learning Centre "Leque" design by CAAD students

Finally, we can say, taking into account the results from the questionnaires and the CAAD students works, that it is clear that the experience on CAAD lectures showed the great importance that students give to Interactive and Rich Learning Environments where learning and studding are mixed with cultural and social activities. They believe that the technologies and interactive artefacts can have an important role in engaging students in learning activities and that these interactive spaces provide a rich and diverse environment that gives new opportunities for different sorts of learning activities and socialization.

CONCLUSION AND FURTHER WORK

It seems reasonable, taking into account all that has been synthesised in this paper, to say that the present studies and results suggest the need for a new form of learning and social environment characterized by different activity settings, small-group activities and strong ITC integration. Moreover, when speaking about embedding efficiently technology in architectural spaces for learning and social activities, interactive digital artefacts can play a key role for strengthening the interaction of students, teachers and university staff with those spaces and foster new ways for them to communicate, study and work within these learning environments.

Nevertheless, for all the above to happen, it seems to us that universities have to be willing to change their facility planning process, their buildings programs, design and both integrate critically and use actively technology in their learning environments. We

believe that this has been the case of U. Porto with the E-Learning Café of Pólo da Asprela program, the new design proposals of U-thinking, E-Learning Design of Outer Space Garden and the new E-Learning Café for Botanical Garden, plus the research conducted until now focused on these issues, which all constitute important steps in that direction.

In fact, having seen how social areas in the university environment are important to enhance the learning and studying process and to create an overall atmosphere with which students can identify and feel a sense of ownership of the environment where they study and socially interact (Joss, 2011), we created a set of rich and diverse interactive social places in our Learning Centres that are also able to integrate some level of customisation by students.

Then, at a certain stage, we also tried to better integrate, in the study, evaluation and design process of E-Learning Centres, the students who showed a special interest in these study areas, making them part of our team work and testing some new ideas coming from their creative thinking. By doing this, we are convinced that we have more possibilities for enriching our study for new ways to experiment digital design in architecture and are also able to test those ideas in real life scenarios and have a different awareness of the architectural limits as an expression and image of our time. This can be seen especially with the new design proposals of U-thinking, E-Learning Design of Outer Space Garden. The design of U-thinking constitutes a very creative solution that integrates, in a unique way, the learning and socializing program for E-learning Centres with an innovative coverage in the form of a cloud and a lower level ground design for the E-Learning Café Outer Space in Asprela.

It is worth pointing out that the research and design of learning and socializing spaces with strong ICT integration developed by the CCRE group until now shows that, in contrast to the visual art media, the interactive environments takes the body of the visitor and ensures their action/motion in space. This could be clearly seen through the several workshops with interactive media held with students in the multimedia room of E-Learning Café of Asprela, and can also, in some way, be concluded after reading several writings of diverse authors (Bullivent, 2005; Castle, 2007; Hertzberger, 2005) and several case studies already pointed out in this paper.

Finally, we give some evidence that backs up what many authors assert for, and this is that architecture in general, and in these type of learning environment programs in specific, should integrate a spatial evaluation system in their design process (Sanoff, 2001; Brown, 2005; Schaller and Huley, 2004) explaining also how we have conducted our evaluation of the E-Learning Café of Asprela. In our opinion, this should be the most secure and reliable base for proposing physical improvements to university buildings since evaluation is a method of identifying needs and making possible the correction and the upgrade of these spaces in accordance to their functions. As a matter of fact, it could be seen until now that articulated and flexible spaces, which incorporate digital interactive artefacts that are able to manage different uses, are of paramount importance for

encouraging strong interchange of ideas and diverse social interaction within a learning environment. Also, very significant, are the results obtained for the performance of the learning environment of E-Learning Café of Asprela and its diverse places for Socialization, Individual Study, Group Study and Cultural activities, which corroborate the importance given to them in literature review and case studies presented in this paper. It seems, therefore, that they should be considered of paramount significance for building a rich learning and study ambience supporting a community of inquiry.

We are really convinced that our research agenda and design work allows the group to examine, in a significant way, the potential of interactive spaces, as well as outline a vision for the future: what these spaces are, what is their impact in our lives and what are the parameters for their design.

Thus we believe that it is by integrating technologies and architectural digital artefacts actively in the design process that these can (1) foster communication and interaction between people; (2) allow for different levels of privacy and types of activities within a university facility or program; (3) open these university places and programs to the city and abroad.

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Using 360° Virtual Tours to Create Inspiring Learning Spaces

Sandra L. Franklin

BACKGROUND

The University of Central Oklahoma (UCO) is guided by its mission of providing transformative experiences so that graduates emerge as productive, creative, ethical and engaged citizens and leaders contributing to the intellectual, cultural, economic and social advancement of the communities they serve. Transformative learning at UCO is defined as a holistic process that places students at the center of their own active and reflective learning experiences, and UCO strives to ensure that each student is competent in the "Central Six", discipline knowledge, leadership, creative and scholarly activities, global and cultural competencies, service learning and civic engagement, and health and wellness.

In 2010, the University of Central Oklahoma opened a new classroom building designed to provide innovative and transformative learning spaces. Classrooms were outfitted with movable furniture that could be easily maneuvered into layouts for lectures, small group work, or individual presentations. Each classroom features multiple projection screens, "Huddleboards", and other flexible, collaborative accessories. Informal learning spaces were included for students to collaborate or meditate; there is even an outdoor classroom with waterproof chalkboards and stone seats. The expectation was that professors would be inspired to start each class with the room arranged in a way that would be most conducive to the learning objectives slated for presentation.

In theory, this was an excellent idea, but in reality, professors were confused and unsure of how to teach in this brand new environment. Nearly all of the professors were still teaching in their most comfortable style: the 50 minute lecture with passive students taking notes. When some professors were asked if they wanted clear glass doors installed to replace the standard wooden doors, most declined as they did not want other professors to see them teaching as usual.

SOLUTION

The eLearning team in the Center for Professional and Distance Education is charged with providing innovative eLearning solutions, faculty and student support, instructional design, web application programming, and other related services for faculty and students engaged in distance learning. One of the applications recently adopted by the eLearning team was Pano-360 from EasyPano (http://www.easypano.com). This software stitches together still photographs taken in a circular pattern to create a 360 panoramic view virtual tours. The original idea for purchasing the application was to create virtual tours

for UCO's distance learning students so they could experience the UCO campus through their computer screens rather than in person.

Using and creating sample virtual tours sparked new ideas for the software, including the creation of interactive scenario-based learning objects (http://www.uco.edu/cpde/presentations/DEMO_Scenario_Showcase/MainMenu.html).

The eLearning team also identified this software as a potential solution to the problems associated with transformative teaching in the CTL. The team created a 360° panoramic virtual tour of a typical classroom in the new building, featuring the best furniture layouts for the various learning situations: lecture/discussion, small group, presentations and more.

Sample activities associated with each layout style are being created and linked to the layout views; professors can easily print the samples, customize them for their specific learning objectives, and incorporate these rich, interactive activities to provide deep learning experiences for students. The library of classroom layouts and associated activities will continue to grow as more professors use the tool for their classes. Although the CTL was built to specifically encourage interactive, transformative teaching and learning, this tool can be used in any classroom where furniture can be rearranged into a variety of layouts.

Next steps will include 1) creating customizable activities pages where professors plug in the learning objectives and learning activity details to produce teaching aids specifically tailored to their content; 2) creating similar 360 views for large format survey classes; 3) creating a searchable database so professors can easily find and implement the learning activities; and, 4) adding tips and instructions on how best to facilitate activities using the layout.

CONCLUSION

Providing modern, flexible, and innovative learning spaces is an excellent method to encourage active, rich and meaningful teaching and learning for university faculty and students. Providing faculty the support and resources they need to make them confident, competent and successful in these vastly different learning environments is equally important. Additionally, using software applications in unintended ways can also lead to high-quality, interesting and useful solutions to common and frustrating problems.

RESOURCES

EasyPano. http://www.easypano.com/virtual-tour-studio.html

UCO Criminal Justice Scenario-Based learning example. http://www.uco.edu/cpde/presentations/DEMO_Scenario_Showcase/MainMenu.html

UCO CTL Transformative Teaching and Learning Model. http://www.uco.edu/cpde/presentations/CTL_Classroom_VR/_flash/TourWeaver_Projectctlclassroom.html.

University of Central Oklahoma Central Six. http://www.uco.edu/central/tl/central6/index.asp.

University of Central Oklahoma, Center for Transformative Learning. http://www.uco.edu/academic-affairs/research-grants/gallery/Center-for-Transformative-Learning.asp.

Section 3
Networked Spaces

Extending the virtual and physical learning environments

Ilkka Kukkonen

ABSTRACT

New teaching methods, technical solutions, and distance learning practices among others have shaped education in elementary and upper level schools. Teachers may teach locally; still, lectures can be provided globally. This challenges the traditional role of teacher as a person in charge of a certain student group or course and it requires new pedagogical skills and understanding of competence development. As McElroy and Blount[1] claimed it seems common to rush to implementation phase of the new technology with the assumption that it automatically saves time and resources. However, this approach often lacks pedagogical viewpoints and presents challenges to organizational culture[2].

In this study, we took a teacher's viewpoint. We analyzed how teachers experienced the development regarding educational space design and technological integration for supporting remote participation. In order to do that we developed enhanced classroom where we could isolate the elements for interaction and support various educational activities with multiple audiences. After two year of active use we asked the heavy users about their experiences. The encouraging results showed us that with comprehensive approach for learning environment design it is possible to support natural feeling of teaching and participation even though some students are present and others are participating remotely.

Keywords: space, design, participation, video, lecture capture

INTRODUCTION

School and work in the future will be very different from today. Pedagogical models need to be reformed for fulfilling the future requirements, and technology serves as a basis for this development. Aducate – Centre for Training and Development of University of Eastern Finland has a long tradition in developing pedagogical video distribution solutions. Since 2003 we have aimed at developing classrooms and lecture halls that are equipped with automated streaming technology. Currently, the broadest installation consists of about 120 fully equipped classrooms. Since then, we have also been active on developing systems that enable capturing and evaluation of teaching situations for research purposes.

Recently, we conducted a development project where teachers were encouraged to develop their skills to solve the practical problems that they had met in their own organizations. During this project we noticed that some teachers were cautious about distance

learning practices because their earlier experiences. Especially, teachers felt challenged if some participants were present in real life session and the rest were participating online.

The virtual experience of participation that is gained through the Second Life for example was not by far, according to teachers, equally experienced by those who stay in classroom.

This led us to think about whether it is possible to share the experiences both among local and remote participants using virtual worlds and comprehensive interaction design. Thus, in this project we designed a new concept for classroom that is furnished to encourage creativity, sharing, and communication.

After the project we identified that problems were quite often related to space and remote projections of the classroom. We wanted to gain deeper understanding how the active users experienced the space and about how the features and functionalities lived up to their expectations. Thus, we conducted a qualitative inquiry with inductive content analysis with eight selected users of the classroom.

This paper approaches the case by describing the need and the technical solution and then moves on to data acquiring and analysis. Finally, the tentative findings of the research are discussed.

INTERACTION AND AUTOMATION IN WISH LIST

We started to think about how virtual experience could be shared among real life students and teachers as well. Of course sophisticated technological solution with real world size projections helps participators to gain the feeling but they do not necessary encourage interaction. Technology enables at its best superficial communication between those who can be touched in real life and virtual representations such as avatars but not vivid communication and interaction that is totally free from space differences.

Combining local and remote participants as technological installation is not too complex with modern technology, but as pedagogical challenge engaging both audiences equally it is generally considered difficult. To support this interaction became one of the most fundamental design principles for the development. The main function of the classroom was to offer premises to different kind of pedagogical activities and experiments designed in this project by participating teachers, tutors and students.

Real-time video streaming for collaborative sessions involve many technical challenges, which can be addressed with modern technology. Streaming to multiple audiences must be synchronized to provide equal possibilities for participation, since defects in quality and delays in audio or video stream might interfere the experience of interaction. We required that the technology was always on standby and reliable when used. Camera operations had to be automatically controlled by motion tracking and that the audio system supports multiple speakers during the lecture. In addition, we needed in-

tegrated lecture capture system that provided automated recording and distribution features.

The development process was challenging not only for technological issues but for the overall interaction design. Thus, it involved multiple testing phases and development cycles.

Through this installation it was possible to give lectures to multiple audiences by streaming them to different services and channels such as web conferences (e.g. Adobe Connect) and Second Life in real time. At the same time we were able to automate the capture process so that the recorded video is synchronized with material that is presented either on computer or on interactive whiteboard. The archived recordings can also be distributed automatically through VLE's, and students may subscribe them as podcasts or email. Recordings can be watched by any computer, and video podcasts are also available for mobile devices.

Motion tracking cameras were also used to stream the participants from the classroom to the Second Life. The same goes for interactive whiteboard that project the teachers' presentation with real-time notes simultaneously for both audiences. The sound system was designed to support free movement and discussion in the classroom and voices are still clear and free from echo even when the participants are communicating back and forth between the physical and virtual worlds.

Virtual worlds free participants from text-based environments and offer them alternative possibility to use video as participatory media for teaching and learning. Second Life is not initially designed as learning environment, but active development community realized quite fast its potential for education and possibilities for creating meaningful interactions. Second Life builds on the multilevel social interactions and low hierarchy between participants which are also considered as cornerstones in modern learning theories.

The immersive experience with the Second Life among other virtual worlds can be quickly adapted for different situations and distributed for different audiences with the powerful 3D building tools and Second Life's native scripting language. Self-representation as avatars and Second Life's 3D spatial voice and audio-functions help to simulate the feeling of attendance and lower the threshold for participation and interaction. With the interactive and real-time projections between virtual worlds and classrooms' visual aids, such as interactive displays and visualizers, we can synchronize the progress of the session better for both audiences.

Also the visible environment affects what kind of learning experience is created between the virtual and the real. Therefore special attention was paid to space design in both environments. We wanted to design and furnish our classroom as it was a space in the Second Life. That is why we used colours and furniture that can be found in every living room – in the Second Life or in the "First Life". Thus, the challenge, which at first

appeared as technical, involved the designers to pay attention to supporting interaction, functionality and even decoration, just as Karl M. Kapp and Tony O'Driscoll[3] in their "equation for engagement" anticipated. As a result, we designed new concept for classroom that is furnished to encourage creativity, sharing, and communication.

DATA ACQUIRING AND ANALYSIS

Our first remarks from the practice were parallel to our expectations that developing a technological classroom with practical requirements of teaching in priority may encourage teachers to utilize and address the potential of the current teaching technology. Still, our findings were then based only on observations in short project and all the people who used the classroom in practice were doing it only once or twice. That's why we decided to collect another set of data from those teachers and other practitioners who had used the same classroom much more often.

We chose eight informants according to their activity. All of them had used the space at least 20 times as participant and the host, and most of the informants used the space both for educational purposes and in meetings. Data was acquired through emailed questionnaire. Afterwards the data was supplemented by short face-to-face meetings if necessary.

The results were analyzed through content analysis. First, the original answers were reduced into short sentences. Then similar sentences were grouped, and these groups were then further categorized. Inductively we found seven categories including homogeneous set of opinions and experiences that the informants were given. All the categories were labelled so that each label described as well as possible the content of the category. These labels were such as natural feeling for teacher/presenter, maintenance and continuous development, and technology as agent of change. After this categorization we turned back to original sentences so that the tentative findings could be abstracted from the labelled categories.

RESULTS

The data indicated that the purpose driven space for connecting remote and present groups provide a natural feeling for teacher or presenter. This feeling was encouraged and supported by various functionalities. Informants mentioned the option to project the displays to walls as a function that encourages the emergence of a natural feeling. In general, people who had used the space were satisfied with current equipment and technical features such as sound and camera systems, and large screens. Interestingly, the data showed that the current users of the space challenge developers to continuous improvements and to test new features and functions. It seems that the more people use the space and provided functions, the more functions they require. Future requirements varied user by user but by and large they were minor modifications, e.g. background noise control and adjustments in lightning setup. Most often informants complained

about difficulties to integrate their own laptop to the system.

There is always a threat of inequality when a part of the participants are remote and others are present. Users of our space were afraid that remote participants may feel unequal. To avoid this, teachers and presenters felt that they have to develop skills to encourage interaction. However, technological features served also as a trigger or motivator to develop these skills. Technical support was required to ensure up-to-date configuration and overall performance of the room. Instead, the most experienced users did not indicate any need for supporting activities.

Even though a small classroom with limited air conditioning and furniture was reported to limit group size, mainly it was seen as intimate space for special group tasks. Especially people appreciated that comfortable and compact space seemed to orientate participants to focus on a certain task.

DISCUSSION

Lecture capturing has plenty of benefits. Video promotes pedagogical democracy, sustainable development, and ecological viewpoints. Lecture capturing and distribution expand the concept of participation. Geographical distances, learning difficulties, and social barriers do not hinder the attendance at lectures. Systematic lecture capturing set a framework for never-ending lecture. Traditionally, lectures are seen unique occasions where supply (teaching) and consumption (learning) have happened simultaneously in the lecture hall or classroom. However, this uniqueness vanishes after lecture capturing because students are able to follow teaching remotely or afterwards when it suits best their needs and schedule.

Lecture capture challenges the traditional role of teacher as person in charge for specific group or class. Even if the lecture appears very interesting and motivating, watching it online may require great deal of undivided attention and still the experience may have a boring effect. Couple of hours online is completely different scenario than participating the lecture live at lecture hall [4,5].

Especially when the course is provided to external audience, teacher becomes “performing artist” of educational domain who rarely sees or gets to know his/her students in person. This changes the pedagogical relations and participation methods and so requires also new pedagogical skills from the teacher[6]. Remote participation challenges the student as well. If the desired pedagogical function for the recording is to support retention for students present at the classroom, it can appear difficult to deliver the same feeling and experience to remote participants[7]. Martyn[8] reminds on the social aspect of pedagogical development and summarizes that pedagogy for learning technology should include interactive discussions and activities. Successful pedagogical solutions involving the information and communication technologies are created with the skills to think or interpret traditional approach in alternative way. The added value must be also communicated in right manner and context to correct audiences.

Adoption of lecture capture system binds organizational resources and therefore limits other development dimensions of ICT in education. When provided as technological commodity for providing access to lectures it can present false feeling of sufficiency that organization's educational technology is aligned to match the challenges of modern learning environments. In situations like this the answer to development needs is based on the selected technology, not the dialogue involving learning theories. Also if the effects and benefits of the implementation are justified primarily by the volumes and usage statistics of the recordings, there is a threat that the qualitative and pedagogical development can fall short. Therefore as Koumi[9] makes a plea to educational developers not to try compare media. Instead, he encourages them to develop and refine the criteria for deploying media to best effect and to develop and refine the principles of effective design within each medium. In other words, we need to design pedagogical interactions based on a medium's distinctive capabilities.

The key finding of this research is that with a proper space and technology design it is possible to provide teachers the same feeling as in traditional teaching settings. The current technology enables them to achieve the natural feeling of participation even though some students are present and others are distant. After experiencing our enhanced classroom in practice, teachers seem realized the potential of the virtual worlds and the integrated technology for supporting remote participation. Actually, the technical features trigger teachers to develop new skills to utilize the full potentiality of this technology. Our case asserts that with comprehensive design for learning interactions, it is possible to support the shared experience between remote and local participants.

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Web 2.0: Enabling Students' Critical Thinking Skills through Deferred e-Learning Systems

Nandish V. Patel

ABSTRACT

Cognition involves the acquisition of knowledge and understanding through thought, experience, and the senses. Psychological theories of cognitive development associate the most advanced stages of intellectual development with the ability to think critically. Developing critical thinking skills among students should be teachers' goal at universities, but studies reveal that faculty are confused about what constitutes critical thinking, the best classroom activities to encourage its development, and how to assess it. To compound the difficulty of teaching critical thinking skills, informed teachers' primary task is to impart discipline-specific knowledge and its assessment through individual course assignments and terminal examinations. In this context, the challenge of imparting critical thinking skills is even greater in e-learning spaces. How should we design e-learning spaces to teach critical thinking? Our research aims to develop deferred e-learning systems for teachers to use, and explores the idea of enabling students to use it too, to acquire critical thinking skills. How do colleagues define critical thinking and how do they teach it, and how do students acquire critical thinking acumen? Deferred e-learning systems is the idea that Cartesian rationality solely is insufficient to design learning (e-learning) and that it is necessary to include the ideas of emergence and self-organisation by individuals and groups.

Keywords: Critical Thinking Skills, Cognition Theories, Deferred Model of Reality, e-Learning Systems, Deferred Systems, Theory of Deferred Action

INTRODUCTION

Studies, including the present research project, reveal that faculty are confused about what constitutes critical thinking, the best classroom activities to encourage its development, and how to assess it (Paul, Elder, & Bartell, 1998). Even before we are able to clarify the teaching of critical thinking skills in the physical class-room space, our approaches to learning and teaching are beginning to be changed radically through the Web. Universities, charitable and philanthropic organisations, and private companies now offer web-based learning and teaching facilities. But these initiatives are technology-led. The information technology and the Web have determined what students are given electronically to learn about their disciplines. Web 2.0 has invited teachers to consider twits, social networking sites, and cloud computing as teaching tools. Hardware devices like tablets and smart phones are being discussed as in-class aids to learning and teaching.

The quality of these provisions yet remains to be evaluated. Whether they improve teachers' ability to deliver discipline material or significantly enhance students' learning as evidenced in assessments is still an open question. We have not even begun to evaluate the teaching and learning of critical thinking on e-learning systems.

The aim of this research project is to improve the learning and teaching of critical thinking skills by enabling it electronically. It aims to demonstrate what methodological and tool support is required to teach critical thinking skills electronically and to develop the Web-based e-learning resource as a deferred e-learning system. What effective critical thinking skills pedagogy can be used at module level and for dissertations, and how can it be incorporated into the teaching strategy of the module? The aim is to develop a critical thinking skills toolkit which can be used in practice. The critical thinking skills toolkit can be used to incorporate pedagogy to develop critical thinking into module teaching. A particular issue explored is how learning technologies cope with facilitating critical thinking.

First, the literature on teaching critical thinking skills is reviewed critically, focusing on models of learning and teaching. The deferred model of learning and teaching is then proposed. Empirical research being conducted at Brunel University's Brunel Business School among learners and teaching staff is then briefly reported. The paper is then concluded with a discussion of the research to date.

ACADEMIC SKILLS SET

Memorising facts and recalling them is a cognitive activity but learning requires multiple skills including description, analyses, comparison, synthesis, evaluation, application, and above all criticality. Barnett (1997) goes further, arguing that a university education should go beyond critical thinking to develop 'critical being.' In this idea students not only reflect critically on knowledge, they 'also develop their powers of critical self-reflection and critical action.' Developing criticality among learners needs to be balanced with imparting the requisite body of knowledge in the discipline.

Bloom et al. (1956) developed a classification of levels of intellectual behaviour in learning. This taxonomy contains three domains: the cognitive, psychomotor, and affective. Within the cognitive domain, they identified six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. This domain and all levels are still useful today in developing the critical thinking skills of students and it informs the present research. But more pertinent is the work of Argyris and Schön (1996) on single-loop learning and double-loop learning. Single-loop learning is the detection of errors and its correction and double-loop learning is the questioning of the underlying assumptions of problem and questioning the very activity and its validity.

Learners feel satisfied when they are able to add value to their personal knowledge-base, and they are more valuable to employers and society when they add knowledge that is innovative. Such value can only be created when learners are able to think critically about the body of knowledge in their discipline. *I think critically, therefore I add and*

am of value, is the pithy phrase that summarises the aims and expected outcomes of this project. In this paper, we argue that the quality of e-learning systems can be improved by using appropriate models of learning and teaching, rather than being led by technology. We consider the deferred model of learning and teaching as an appropriate model for designing e-learning systems, and examine its relevance for teaching students critical thinking skills.

CRITICAL THINKING IN COGNITION THEORIES

Critical thinking is reasonable and reflective thinking concerned with deciding *what to believe or do* (Ennis, 1985). Its purpose is to decide or conclude a belief based on evidence (Ennis, et al., 2003). Critical thinkers evaluate related statements and improve their 'meta-cognition' – think about how they think (Raiskums, 2009).

Many ideas and theories claim to be true or provide some accurate account of the data and evidence. They vary in scope, credence, and support. In critical thinking, 'What matters are the reasons the thinker has for believing and its implications' (Fisher, 2001). This process needs an 'active, persistent, and careful consideration in the light of the grounds which support the belief and the further conclusions to which it tends' (Dewey, 1909, p.9). Critical thinking is interpreted as both a mode of thinking as well as a set of behaviours (Cheung et al., 2002; Facione, 1990). Conceptualizing critical thinking as both a set of cognitive skills and affective dispositions is illustrated by the American Psychological Association:

> "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. These cognitive skills are essential for inquiry and the ideal critical thinker is the one who is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit" (Facione, 1990).
>
> The literature recognises that critical thinking is the active process which goes beyond basic acquisition and memorization of information; it requires the ability to recognize and rationally consider multiple concepts or elements which constitute a body of thought. Critical thinking is the cognitive ability to understand and contribute to the discourse. New information is compared with currently held assumptions and assimilated so that one can make reasonable deductions or devise a plan of action (Bowell and Kemp, 2005; Kurfiss, 1988).

The focal learning environment plays a developmental role in developing critical thinking. Tsui's (1999) research reveals the importance of the active involvement of students to develop critical thinking. Students regard themselves as 'active contributors' when exposed to classroom environments that foster critical thinking skills. To encourage critical thinking it is necessary to make complex problem solving active by enabling students to construct knowledge alongside professors and instructors (Tsui, 2000). Students should be encouraged to belong to the community of scholars, which encourages analysis, discussion, and reflection (Pascarella and Terenzini, 1991).

This kind of evidence suggests that critical thinking is an embodied experience rather than simply cognitive, the mental activity of logical and reasonable thinking. It is behavioural in nature than simply cognitive. In this context, the theory of deferred action is invoked later because it seeks to explain human designs, which includes designing education and being educated, as embodied enactments in emergent contexts.

PHILOSOPHICAL PERSPECTIVES ON CRITICAL THINKING

Critical thinking skills are more important than problem solving skills. Philosophically, critical thinking begins when learners begin to distinguish between good and bad. Perry (1981) postulated that an individual learner's critical thinking begins with the dualism of good and bad authorities. Learners then have to translate and transfer this critical thinking to disciplines and technical subjects taught at university. Distinguishing between good and bad discipline authorities whether in physics or computer science, management or social science embodies critical thinking skills.

Descartes set the tradition of reasoning rationally about the world around us with his first principle of knowledge *Cogito ergo sum*; or 'I think, therefore I am' thesis of what it means to be human and know empirically of one's existence. At the core of this tradition of rational reasoning about the world is the notion of criticality. It is vital to develop students' critical thinking skills, since criticality is the distinguishing quality of a university education. The structuring and determination of the contents of an essay requires a critical reading of the extant body of knowledge. Identifying a topic to research for the dissertation requires critical thought and critical action. Students need to develop the skills of critical thinking to complete intellectually satisfying assignments, essays, and dissertations, and respond to examination questions.

Thinking critically about knowledge is at the core of a university education. Critical thinking is a 'desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order; and hatred for every kind of imposture' (Francis Bacon, 1605). Critical thinking requires the development of rational thought. "Critical thinking is deciding rationally what to or what not to believe." (Norris, 1985).

Thus the ability to think sceptically and to think in a reasoned way about the evidence characterise critical thinking. It is concerned with eliciting and reasoning with the em-

pirically derived evidence. But how can this be imparted to students and communicated to colleagues? Should critical thinking be embedded in modules or be taught separate? What is the impact of thinking skills approaches on learning? Research reveals that although university teachers believe that critical thinking is the primary objective of their teaching, only 20 percent could give a clear explanation of critical thinking (Paul et al. 1997).

DEFERRED MODEL OF LEARNING AND TEACHING

The deferred model as applied to cognition is deduced from evolutionary biological theory. Human learning is dependent on the environment, humans learn according to the requirements, constraints and opportunities of the environment. Learning happens in the environment, and as the environment changes human learning strategies change too. This kind of change is termed adaptive learning and is achieved through self-organisation; in the process of learning individuals self-organise locally.

Another important aspect of the learning situation is emergence. Emergence is unpredictable and requires appropriate response by learners in the situation. Consequently, the nature of learning is emergent. Whilst emergence in the deferred model is based on the general complexity theory, it is also recognised in the literature on learning. Engeström (2009) posits that learners' observation and active engagement with the environment results in 'expansive learning', which is continuously emerging understanding of the object of interest.

Web 2.0 technologies contain such an element of unpredictable emergent communication among participants, which can be catered for by deferred e-learning systems. The idea of deferred e-learning systems comes from the Theory of Deferred Action (Patel, 2006). The theory of deferred action is a design and action type theory; such theories are developed to inform practice (Gregor, 2006). The deferred model, stemming from the theory, has been applied by Dron (2005) to design an e-learning system.

The theoretical insights from the theory prompt the need for new pedagogical methods and tools to cater for *emergent* learning. Emergence requires learning designers to postpone or defer decisions regarding individual situational aspects of learning actions, the need for e-learning resources support for this purpose, and as a consequence the need for greater active involvement of learners in the process of learning design and adapting them to emerging learning situations.

Deferred e-learning systems enable teachers to plan in advance and learners to adapt learning to a concrete emergent learning situation. This is achieved by dividing learning design between the 'reflective designer' - the teacher - who has substantial discipline-specific knowledge and expertise in pedagogy and can plan rationally learning programmes, and the 'active designer' – the learner - who is aware of lacunae in their personal learning and understanding.

The deferred action design construct enables rationally planned systems, like e-learning systems, to function in context in emergent situations. The design of learning is rational action aimed at educating students. But it needs to account for the emergent learning situation. Deferred action is a synthesis of rational learning design and situationally aware action.

The theory of deferred action reconciles rational design with emergent situations. Emergence is addressed by synthesising rational design with emergence to produce the deferred action theoretic. Action that needs to be sensitive to the situation is best achieved by drawing a plan of action, which allows actors in the situation to make the necessary adjustments in response to emergent factors. This kind of planning is called a deferred system, as illustrated at point B in Figure 1.

Deferred action design space for controlled emergence of organisation and systems

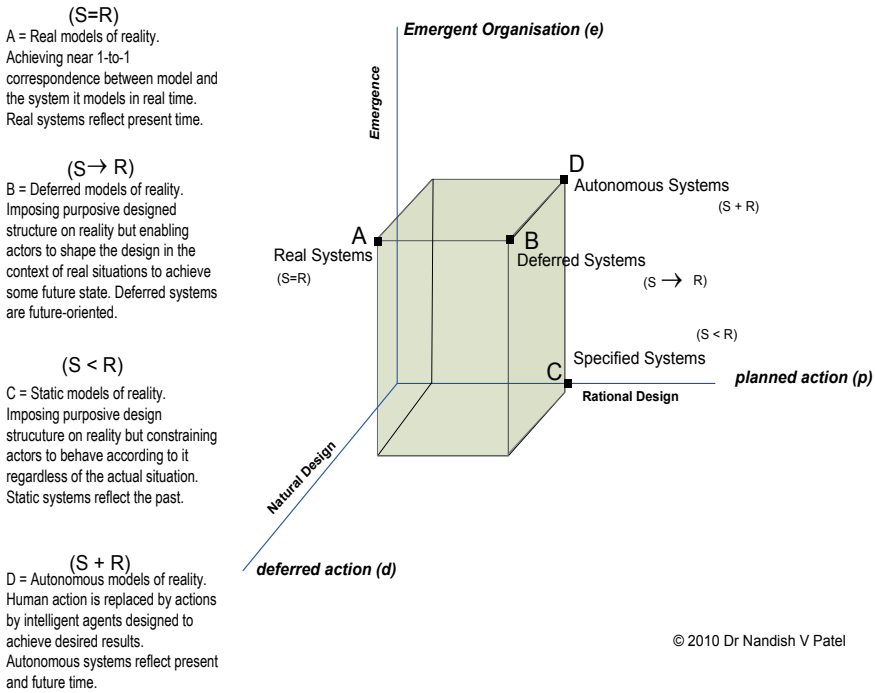

Figure 1:

Deferred Action Design Dimensions for Designing Artificial Complex Adaptive Systems

Deferred action is unpredictable emergent local action. Figure 1 depicts the space for designing for emergence. It depicts controlled emergence of systems at points A, B, and D, systems which adapt because they are affected by changing environment. The other system types depicted in Figure 1 are covered in Patel (2011).

Deferred systems at point B depict the deferred model of reality, which is the theoretical model we use to design deferred e-learning systems spaces. A deferred system is future-oriented. The system implies a new reality (S□R). Point B depicts deferred systems as deferred models of emergent social action, such as social media and Web 2.0 technologies. Purposive action is future-oriented as it seeks to achieve predefined goals. It changes the current situation into the desired situation, which educationalists seek to do by using social media.

According to the deferred model, e-learning systems are co-created to achieve specific learning outcomes but the actual learning environment is moulded by learners and teachers in actual situations. These are emergent learning systems as opposed to static learning systems, as shown at point C.

The rational learning plan or syllabus and the expected learning outcomes are depicted on the x-axis as planned action. However, this planned action is affected by changing environment, for example learners' ability, which results in unpredictable emergence, depicted as emergence on the y-axis. Deferred e-learning systems respond to the unpredictable emergence as deferred action, the action that learners and teachers take locally – depicted on the z-axis.

DEFERRED E-LEARNING SYSTEMS

By interpreting Web 2.0 technologies as deferred systems, point B in Figure 1, it is possible to manage unpredictable emergence in social media. Educationalists use of social media is planned to help achieve learning outcomes – this is the planned action dimension of the theory. However, the communicative acts of teachers and learners of social media, may lead to unexpected emergence.

A deferred system is deferred until action designers (learners) decide what it becomes in actuality. A deferred system is the synthesis of the three design dimensions planned action, emergence and deferred action. This synthesis is necessary for conceptualising and developing deferred systems capable of responding to emergence. Emergence is a constant in social action, so information will also be emergent.

The World Wide Web and Web 2.0 technologies are examples of deferred systems. They are planned by the World Wide Web Consortium accounting for the planned action design dimension. But the actual content of the myriad Web-based systems is determined by active designers, accounting for the deferred action design dimension. The whole Web is an emergent phenomenon, accounting for the emergence design dimension.

The informational behaviour or functionality of deferred systems is underspecified. But the deferred system is designed to enable controlled emergence arising locally through the communicative acts of people participating in Web communities. Deferred systems are self-organising because local action is necessary to respond to environmental disturbances. While the Web 2.0 technology is centrally planned by educationalists, the

Web learning communities themselves self-organise, as separate individuals, groups, and organisations apply it to resolve their particular learning needs.

Deferred systems are designed based three design dimensions, planned action, emergence, and deferred action. Deferred action is the synthesis of planned action and emergence. Figure 1 helps to depict the three dimensional space necessary for designing socio-technical systems like social media that have to cope with emergence.

In deferred systems planned action is juxtapositioned with emergence to produce deferred action, which is the necessary 'bottom-up action' for coping with emergence. In deferred systems, planning in terms of specifying exact and all functional requirements is minimally possible because social media is affected by emergence. Consequently, it is necessary to enable individuals to act as required in the situation, such action is the deferred action of actors in deferred systems.

A deferred system is rationally designed but enables actors through deferred action mechanisms to respond to the situation. The Web and social networking systems are such deferred systems. Deferred systems are designed by two sets of people reflective designers (teachers) and active designers (learners). Reflective designers are removed from the actual space of action because they are not participants – they are not the intended learners. As such they do not have intimate and embodied knowledge of actual situations in which the social media is used. Active designers are involved in the actual social media as learners.

The theory of deferred action addresses the fundamental problems of analyses of social systems such as social media for learning. Social systems should be analysed as qualities of rational behaviour and emergence. Rather than characterise social systems as some 'social machine' that can be factored and analysed, as engineering approaches tend to do, the social system is conceptualised as autonomous in deferred action thinking. The analyses should be in terms of human aspirations, as well as the design of efficient and effective learning systems.

RESEARCH FINDINGS

This is a summary of the findings of research conducted to understand students' critical thinking skills development practice in Brunel Business School, funded by Brunel University's Learning and Teaching Innovation Fund.

The research aimed to understand and map current critical thinking skills development practice in the school, with the intention of providing Web-based supporting material for teachers to use to develop students' critical thinking skills.

The concept of critical thinking and problem solving used in this research is "minimalist," that is, one which captures the essential dimensions of the concept reflecting the following: its etymology and dictionary definition, major definitions and explanations in the literature, a brief history of the idea, major tests of critical thinking, and the basic

values it presupposes. It forms the core body of research over the last 30 to 50 years (Richard et al., 1997). The components of critical thinking are logical argumentation, assumption-questioning, truth-seeking, problem-framing and collaborative effort.

Critical thinkers typically engage in intellectual practices of the following sort: monitoring, reviewing, and assessing; goals and purposes; the way issues and problems are formulated; the information, data, or evidence presented for acceptance, interpretations of such information, data, or evidence; the quality of reasoning presented or developed, basic concepts or ideas inherent in thinking, assumptions made, implications and consequences that may or may not follow; points of view and frames of reference.

Since we adopted a holistic perspective, in-depth interviews with ten academics and six students were conducted. Six academics were from Brunel Business School (BBS), two were from School of Health Science and Social Care, Brunel University and two were from other UK universities, for comparative reasons. Five PhD research students and one postgraduate student of BBS also participated. The data was coded using NVivo to develop categories reflecting critical thinking skills development practice in the school.

The constraints to critical thinking skills development in the School at strategic and planning level are discussed first and the then constraints at the operational level. From the findings, cognitive theories, and the logic of teaching and learning strategies a holistic model is proposed for embedding critical thinking development skills among teachers and students in degree programmes, modules, and individual class discussions.

Strategic Direction

Based on value congruence theories and findings of this analysis, the first constraint to critical thinking skills development is no clear understanding or agreement among academics and students of critical thinking skills and its value in education and professional life. There is no espoused senior management policy. Therefore, individual academics and students define and operationalise critical thinking skills autonomously, contradictions result for defining learning outcomes for critical thinking skills and methods for its teaching.

Three views on the value of critical thinking skills in modules discernable, those who think critical thinking skills should be a separate module learning outcome, those who argue that critical thinking skills are conjoined with technical skills and those who think critical thinking skills should not be a module objective, focusing solely on discipline knowledge alone.

These disparate views constrain critical thinking skills development because students get contradicting views from academics across the programme. We argue, supported by theories of value congruence, that this lack of consensus prevents the development of critical thinking skills in the school. Therefore, we suggest that BBS senior management need to develop a strategy for critical thinking development, which defines critical

thinking skills development and its value on our programmes and to industry, and maps out a two year operationalisation plan. Strategising should involve focal stakeholders i.e. students and academics, as well as extended stakeholders, BBS management and potential employers.

Attention should be given to constraints that occur at the operational level of critical thinking skills development, involving students and academics interactions in lectures, seminars/workshops and tutoring. Students need to be motivated and instructed on how to access and read available resources. Use of learning technology and social media could build motivation and capability of students. Academics and students proffered that they found video-based teaching and inclusion of social media more effective in developing critical thinking skills. Critically, BBS senior management need to improve technology acceptance among academics and students.

Academics also argued that the existing duration (time), size (number of students) and diversity of students (international students) also constrain them to effectively develop students' critical thinking skills. These three factors correlate, as a bigger group requires more time and vice versa. Although, there could be some positive impacts of the large and diverse groups, such as having different and more perspectives on academic issues. However, academics voiced that they have insufficient time to embed critical thinking skills development in seminars (which is baffling!). Diversity in students' attitudes and capabilities also constrains critical thinking skills inclusion in teaching and assessment, since material has to be customised to suite different backgrounds and capabilities. Reducing group size may not be operationally and financially viable.

Academics stated that these operational constraints could be managed through application of learning technology such as, saving time by using clickers or twitters instead of raising hands during (large) class discussions. Academics may want to use the recently introduced mice mischief application of PowerPoint to involve large number of students with less time. Teaching assistants could play important role in managing the class relatively non productive and labour intensive tasks.

Theoretical Support

Our study empirically confirms cognitive development theories, which argue that cognitive skills, including critical thinking skills, progressively develop in students. This involves progression of intellectual critical thinking skills. The critical thinking skills content and methods of BBS degree programmes, modules and single class discussions, should reflect the different progression stages of students' critical thinking skills ability. Undergraduate, postgraduate and PhD research students' critical thinking skills development needs be narrowed in lyres of cognitive thinking. This concept is in line with the progression concept of cognitive psychology, stating that 'cognitive development occurs with mounting complex layers of differentiation and integration in individuals' thinking, values, and behaviour (Anderson, et al., 2000; Pascarella & Terenzini, 1991).

Cognitive psychology conceptualizes progression from one stage of cognitive development to another as a way to measure the maturity, depth, and complexity of an individual's thought process and intellectual growth (Kitchener et al., 1984; Perry, 1981; Piaget, 1964), at the upper level of the critical thinking skills spectrum, research students could be prepared to argue about epistemological, ontological, reflexive aspects of the phenomena under investigation.

Academics also confirmed that the means for critiquing is argumentation. Academics and students put their arguments in different methodological containers such as discussion, scenario, assignment, examination, presentation, case or an example. Interestingly, academics agreed that practice based cases and examples are the most effective methods of developing and building critical argumentation. Academics argued that students effectively discuss arguments when they find it part of their experience.

Based on academics' views of their experience, critical argumentation and cognitive progression theories, we propose the hierarchical development of critical thinking skills. 'Lessons' would need to be embedded in the students' familiar situations (practical examples) and then students need to be encouraged to raise supporting and opposing premises and argue their validity and reliability, finally taking a position, which is the purpose of argumentation.

CONCLUSIONS

E-learning theory and practice is emerging and the deferred model of e-learning expounded in this chapter is an important contribution. Successful e-learning systems will result from good e-learning theory. The deferred model recognises both the emergent nature of learning and the potential of Web 2.0 technologies to cater for such emergent learning. Deferred e-learning systems require the educationalist as the 'reflective designer' to plan a course of learning and the learner as 'active designer' to engage with the material in context and to shape it according to emergent learning needs.

Our research reveals that transferring existing face-to-face teaching to electronic platforms, such as teaching critical thinking skills, requires appropriate models of learning. Simple automation is insufficient. The proposed deferred model will be further explored to transfer the teaching and learning of critical thinking skills to e-learning.

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Exploring reuse of open educational resource in art & design practice-based learning & teaching

Chris Follows

ABSTRACT

This paper aims to encourage feedback and debate around issues of how we best identify and evaluate the most effective and efficient ways of using and repurposing open educational resources (OERs) for art and design practiced based learning and teaching. I've worked at the University of the Arts London for seven years, over the past year I have been working on the ALTO project http://alto.arts.ac.uk/ and a S*CORE* fellowship at the Open University http://www8.open.ac.uk/score/fellows where I'm researching how we make explicit the unique tacit experience of art and design learning and teaching by identifying best practice in rich media OER use and reuse within the sector.

During and after the conference I would like to develop an OER arts community of practice to help identify a core cluster of national and international OER arts resource websites from across the sector using the following URL http://process.arts.ac.uk/category/discipline/research-practice/oer-arts-resources.

Keywords: collaboration, reuse, repurpose, open, resources, practice, OER, open educational resources, process arts, sharing, open educational practice, open research, SCORE, Support Centre for Open Resources in Education, Open University, University of the Arts London

INTRODUCTION

Existing spaces

Under the current competitive climate for university places there is an increased and growing pressure to improve the overall student learning experience including the delivery of more open, flexible and blended learning opportunities. A particularly problematic area for practice based subjects such as Art and Design where the full attendance, face-to-face teaching model is traditionally seen as the only, and the best, way to teach, extending the range of study modes and options presents a real challenge. It is clear that the traditional teaching model as well as a wide range of associated institutional support systems needs to change, the tricky questions for institutions is how?

The University of the Arts London is predominately a making university; students are encouraged to be self-directed, reflective and engage in regular peer-to-peer and group critiques. Very few arts courses at UAL provide project briefs, most learning and teaching takes place in peer/tutor led small group collaborative discussions or one-to-one in an 'open' studio environment. Video, image and audio documentation is the preferred media

for capturing and sharing art and design practiced based tutorials and resources.

SHARING RESOURCES

The primary online course communication tool at UAL is the internal VLE Blackboard, within Blackboard each subject area is locked into its own closed section; the VLE can be complex and difficult to navigate. Blackboard does not facilitate sharing or browsing across courses or colleges and is closed to external users. As a result over the past few years content for learning and teaching is being independently dispersed across the web using more familiar and user friendly Web 2.0 environments such as wikis, bolgs, group websites, personal youtube accounts, Flickr groups etc. However cross college 'shared practice' remains a problem, good quality learning materials are being produced and shared either internally, hidden away in Blackboard or lost in locally shared group blogs, these resources often become dormant and forgotten as the onus is often placed on one person 'the teacher' to maintain and develop this content, some content never leaves the classroom/studio.

Over the past three years I have experimented with the development and use of open resources as part my day-to-day teaching practice at UAL, during this period I developed http://process.arts.ac.uk/. Process.arts was developed in 2009 with the aim of creating a new user driven online studio community and collaborative resource that explores process in arts practice by showing the day-to-day studio/professional practice of staff and students at UAL whilst also sharing, informing and engaging with the wider arts community. Resources created for process.arts have been received well internally and externally, an average 40 to 60 unique visitors a day visit process.arts.ac.uk and one video tutorial alone on the process.arts youtube Channel received nearly 40,000 hits along with many comments and interest. Quantitative data such as views and downloads give little indication to how this content is being used.

NEW OPEN SPACES

A key hurdle of moving from a closed space to an open space to encourage flexible and blended learning opportunities was initiated by ALTO in the early stages of the project, the institutional adoption of creative commons licensees within UALs core policy was fundamental to the project and long term institutional change. Its hoped the introduction of Creative commons licensing will provide a sense of 'pedagogic' freedom for teachers and staff to experiment in all aspects of open educational practice. Although this does not necessarily mean people will participate, it is a important step in the right direction of encouraging those within the institution who are on the periphery of being an open practitioner. Creative commons provides multiple license options for the user, e.g. a user can share locally, institutionally or to the world, which means user can license their work to be as open and closed as they wish. These small steps into open practice can help overcome initial staff reluctance to create and share teaching resources. The primary

issues for most academics and technical staff is the amount of time and effort it takes to produce and publish teaching material, some members of staff also have concerns regarding giving away their work fearing this will render them redundant in the long term. For teachers 'approaches and conceptions of teaching' to change regarding aligning open educational practice to match the existing face-to-face method practiced in studios, institutions would need to ensure their teachers hold the same 'commensurate conception of teaching' (Richardson, 2005) towards open practice as they do for current studio practice. To achieve this the institutions at policy level would have to adopt new 'approaches to teaching and conceptions of teaching' themselves in the form of OEP.

If we were to look at the notion of teachers as digital immigrants, who are learning to live with technology and students as digital natives, living with technology since birth. (Prensky, 2001) we begin to see a huge gap that divides learners and teachers. In my experience of teaching digital media over the past 7 years it is not true to say all students are digital natives or all teachers are digital immigrants, although we may see an increasing sway towards this being a problem in the future. As the pace of technology development increases emphasis should be placed on 'progressive practice' and addressing the problems of digital literacy and web 2.0 use in learning and teaching. Prensky (2007, forward to 18:10)

DISCUSSION

Sharing and reusing resources is nothing new in learning and teaching although the notion of OEP is, the University of Oxford recently released their JISC funded OER Impact report[1] the report illustrates the impact of resource use and reuse within learning and teaching. An Iceberg metaphor is used to illustrate this landscape; the top of the iceberg (ALTO for example) is where the openly licensed modules, small pieces of OER are made officially available, visible reuse, institutionally endorsed and viewed as low risk. Below the water line we see the private spaces (VLEs) images in power point, websites, wiki, blogs, and licenses are not seen as important, resources are created from a selection of the 'best' random google finds, we could also relate this to the notion of artists sourcing found footage or objects in their practice. Below the water line is what Dave White describes as the 'learning black market',[2] staff and students copy, reuse and repurpose content as they find it, no process or practice governs this use, there's no other way. With the institutional adoption of OERs and individuals adopting open educational practice as a default starting point we can begin to address modes of operating effectively in this new open space.

One of the key challenges for open practice and research for teachers and students is finding or being directed to the useful open content. Random google searches will get you what you want but the content will be more than likely high risk and non-reusable in an OER sense. If as I did this summer wanted to find animation resources for use in

1 http://www.jisc.ac.uk/whatwedo/programmes/elearning/oer2/oerimpact.aspx
2 http://tallblog.conted.ox.ac.uk/index.php/2011/09/30/the-learning-black-market/

my teaching, google searches even advanced searches returned little to no usable open content.

There is a real need for a federated subject based resource to assist the open search process. The time it takes to find, prepare, produce, repurpose and curate open learning materials needs to be addressed.

As Beethoven once wrote "There should be only one repository of art in the world, to which the artist would donate his works in order to take what he would need".[3]

Authoring published content which is 'open to the world ' presents new problems with how we manage feedback on our open content, by operating in this new open space we have to consider the new parameters of our practice.

HOW CAN WE REUSE OER CONTENT IN ART & DESIGN PRACTICE BASED LEARNING & TEACHING?

Authorship as selection: I have used and reused resources myself effectively to support and enhance my teaching practice and the learner experience although I have little evidence of how others have used. It's generally unknown how OER content is going to be repurposed and reused and there is very little evidence of this happening. Its thought sites such as process.arts and ALTO will attract a mixture resources, mostly granular in nature, although these standalone pieces of content are interesting it is difficult to assess how 'useful' they are with regards to learning aims, objectives and outcomes. On there own, these 'informal' learning resources could be dismissed as having little or no academic significance or use to the curriculum framework.

Below are some possible questions for debate, please feel free to suggest new questions and/or contribute, thank you.

WHAT ARE THE MAIN BARRIERS TO OER REUSE?

How do we share and collaborate in this space and overcome the obstacles of use and re-use specifically when creating and designing complex rich media learning resources and objects?

Develop an Arts-OER 'reuse' community of practice, how would a discipline-based, cross-university online community of practice help to overcome staff reluctance to create and share teaching resources in an OER environment?

Examine the effective use of source files and edit notes in relation to producing better 'editable' learning resources.

3 http://www.webcitation.org/630zqaY05

WHAT ARE THE MAIN DRIVERS TO OER REUSE?

The ALTO project team4 has concluded that there are many strong benefits for involvement with OER and its associated communities, because:

- Support greater flexible and blended learning opportunities for future students in order to extend the range of study modes and options at the UAL and beyond.
- It is an effective institutional and professional development tool in the context of externalizing practice, pedagogic conceptions and strategies in order to support reflection and development.
- It provides a foundation to introduce and extend collaborative learning design skills amongst staff to support greater flexible and blended learning opportunities in order to extend the range of study modes and options
- It brings external business and collaboration opportunities

WHAT EVIDENCE DO WE HAVE FOR OER REUSE?

Observe and contrast current practice in the OER community.

Share stories, explore and exchange stories and examples of existing OER reuse practice which exploit the creation of new resources through the appropriation and reworking of existing content, ideas, materials and processes.

The arts have a strong tradition of creating new meanings through the appropriation and reworking of existing content, ideas, materials and processes, how can this tradition inform and encourage the development and reuse of OER rich media content.

Some examples of student and staff resource - http://process.arts.ac.uk/content/examples-staff-content Please forward links to OER arts resources online and I will add them to the following cluster – process@arts.ac.uk

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An art school's website as an up-skilling and match-making platform?

Peter Purg

ABSTRACT

The paper poses questions on why, what for and how to expand the functionalities of an art school's present public website from (formal, non-formal and informal) education onto the business paradigm. Such an expansion of the existing multi- and social-media oriented platform would focus on competence-oriented training and job-focused match-making between academia on the one hand and creative industries or art markets on the other.

Investigating possible future developments of (public) learning spaces, we intend to define the key roles that a (private) art school's website can play as both an institutional space for formal data transaction and promotion, as well as an inclusive social space for dialog and debate. (How) Can such a website become an innovation-boosting networked space for creative idea filtering and distillation, business match-making as well as "human resource transactions"?

On the theoretical background of connectivism and producerism as two prominent paradigms to the social aspect of digital media, and along the practical annual academic cycle (curriculum, website etc.) development steps, the planned interactive media project seeks to deconstruct the myth of incompatibility between artistic and business realms. Shifting somewhat optimistically from an as if autonomous arts-only towards a business-inclusive and market-affirmative position, the project will however seek not to succumb to any among the numerous traps of the neoliberal paradigm, especially dangerous if applied to educational and/or creative settings without sufficient reflection.

Keywords: connectivism, platform, producerism, businessing, marketing, web, social media, art school, innovation

SCHOOL DEVELOPS EPLATFORM (THE PROJECT'S PREDECESSOR)

To fully understand the presently discussed project, it is first necessary to briefly look into its history – not without several symptomatic technical as well as social connotations of certain generality: reaching back onto 15 years of experience in art education, the School of Arts at the University of Nova Gorica (UNG) in Slovenia has for the first time entered the formal context of university in 2009, developing a curriculum in Digital

Arts and Practices meant to combine the seemingly opposing processes of creating (interactive media, video, animation, photography) not only for the world of art, but also for business and industry. The school's previously successful (project- and workshop-based) instructional model was at that point expanded onto blended learning (all courses running on Moodle learning management system) and a complete renewal of the school's web presence was agreed (developed on Drupal content management platform). Both web-based development strands were combined in a project called "ePlatform" that also included several realm-specific experimental approaches from e-learning materials production to academic (self)reflection, all based on a media-ecological blend of concepts such as crowdsourcing, connectivism and producerism (Purg, 2010). Replacing the traditional communication and collaboration paradigms of the 20th century, such

> "emerging models of information and cultural production, radically decentralized and based on emergent patterns of cooperation and sharing, but also of simple coordinate coexistence, are beginning to take on an ever-larger role in how we produce meaning-information, knowledge, and culture in the networked information economy." (Benkler, 2006, p. 32)

A thorough review and redesign of teaching methodologies integrated current new-media based standards as well as introduced novel, custom-developed concepts and practices of instruction, all converging onto an ("internal") learning management platform, ultimately combined with the school's website (http://vsu.ung.si/). The latter was completely redesigned, structurally and conceptually expanded to become an ("external") platform of education, arts, and culture, serving not only the school's own purpose but also a larger (national, i.e. Slovenian-speaking) public, offering a dedicated and inclusive community space for digital arts and creative industries. Bringing the latter closer to the (traditional) arts context was another important goal, with a wider aim to pluralize the disciplinary context of tertiary education in Slovenia. Including research-based interactive media development as well as teacher and student trainings, this holistic ePlatform project was subtitled "Internal and public e-platform and e-contents for arts and creative industries study programmes" and received substantial public financial support.

Using open-source technologies and community-based project management (most media-production work came from within the school and its partnerships) the project's ultimate aim was to develop a viable general model for modernizing art schools that, at least in Slovenia, seem to be mostly resistant to change in both methodological base and instructional designs. Yet they are presently in an obvious need of changing their interaction patterns with different publics and stakeholders, especially in terms of bringing business, employment and education paradigms closer to each other – which has not least been an increasingly important national priority (Ministrstvo za gospodarstvo, 2006, pp. 22-32). Indeed, the recent years of the economic crisis made this perspective crucial on a global scale, since specially

> "in times of economic downturn, when graduates face greater difficulty

> to find jobs and enterprises are subjected to higher competitive pressure, the economic and social value-added of university-business collaboration" (EC, 2009, p.11)

becomes particularly apparent in the realm of Creative and Cultural Industries (CCI). Therefore the holistic ePlatform concept (recognized as an example of good practice not only nationally, but also region-wide) was used as point of departure for achieving several further goals (e.g. promotion of work and employment of graduates) – not only in conceptual, but also in technical terms. The needs analysis (Godnov and Purg, 2010) of this previous project showed a clear and present demand especially among students and employers (but also teachers) for some important upgrades:

- to stress the "applied" quality and stronger connect the arts academic realm to the creative industries and the business realm in general;
- to improve the chances of idea valorisation, relevant placement and employment for students and graduates (significantly better in the creative industries than in the traditional art production context);
- to foster integrated use of Information and Communication Technology (ICT) in educational processes within the CCI not only nationally, but also Europe-wide, facilitating international collaboration with optimal use of resources.

Joining the arts and the creative industries in the abovementioned undergraduate study programme proved to be fertile ground for piloting such a strong case of future-oriented arts and media-production pedagogy that logically develops its existing ePlatform with specific up-skilling and matchmaking functionalities, therein expanding the present regional network of schools (of Italy, Austria, Croatia and Slovenia) onto further peripheral regions of Europe such as in this case Portugal and Lithuania, including new partnerships from business as well as the public realms. This is the more important since globally scaled analyses show that

> "the success of many innovative regions in the US and in Europe has been based on a triangular partnership involving universities, business and government, for policy orientation and funding." (EC, 2009, p.9)

SCHOOL TO EXPAND EPLATFORM WITH BUSINESSING FUNCTIONALITIES (THE PROJECT'S DESIGN)

After reflecting upon experiences and insights of the school's ePlatform in its first online year, the next year's project stage intends to expand the process into an important further dimension – to gradually upgrade the school's Digital arts and practices graduate programme curriculum for innovation and knowledge as well as human-resource management and up-skilling purposes. Therefore, we shall seek to first explore, if the promises (of the abovementioned website platform as a public service) in the previous project were kept and how myths of non-formal learning and e-participation were demystified – and not least how this challenge focus changed to open up new realms of experimenta-

tion and inquiry. Upon this evaluation, based on both quantitative and qualitative data analysis, the next development step of the platform will focus on designing and pilot-launching a Europe-wide "virtual" platform, as well as developing a "real" network of schools and businesses intended to breed, mainstream and spinoff innovations in digital media and artistic production, including their intersections with other disciplines. From industry and distribution businesses, as well as from relevant Non-Governmental Organisations (NGOs), such a platform would "import" projects, professionals and lifelong learners into the formal educational process; while "exporting" production ideas, student cadres/crews as well as marketing creative products outside the educational realms. The platform's (online) brokering function between university and business will be organised around a programme of up-skilling and match-making (contact) workshops as well as interdisciplinary curriculum development processes in the schools within the envisaged project consortium. Its partners will not only guarantee proportional and hi-quality platform input, but will also represent the initial network structure/node focusing on digital media (interactive, film and video production) to be later sustainably expanded onto further disciplines and other stakeholders.

In terms of supply-and-demand of the platform's users, the participating schools shall provide innovative ideas, project designs, human resources (students and mentors) as well as equipment – gaining improved and better targeted employability and real-life relevance of educational processes; whereas businesses (incl. NGOs) will provide project demands (tenders), human resources (mentors, project managers and professional teams), equipment and co-financing – gaining innovative ideas and project designs as well as fresh human resources, and of course new contacts (network nodes), including improved visibility. The platform as a combination of online and offline communication and collaboration processes aims to provide match-making between the above two "polarities" as well as up-skilling both sides' stakeholders, and attract new partners and investors, including public funding. Courses will be developed or altered with minimal changes to existing curricular status on formal (accreditation) levels, but with maximum impact on course designs (implementation level), e.g. by importing real-life projects and mentors into project-based courses already defined in every programme of the participating schools. The platform would thus aim to detect and nurture innovative potentials, coordinate production projects and mentor/student cadres with respect to school curricula (and their delivery), whereas the network would provide demand and supply of ideas, projects and resources. The network is to expand through local and specific (sub)networks of individual partners, from business (media and artistic production, incl. interdisciplinary fields) and education realms. After a year's piloting stage within the abovementioned closed network of schools and businesses, the platform would open up gradually and explicitly to new partnerships. Such an (inclusive) online platform can only be produced through interdisciplinary collaboration in website design between industrial-standard web developers, e-learning specialists and intermedia artists; whereas curricular collaboration would focus on intersecting production business and academic processes within course-based workshops and short trainings on different locations across

Europe.

The above-sketched project idea was subsumed under the heading "Platform of Ideas, Crews and Media Production Opportunities" (acronym: PICmediaPRO) and an international consortium seeded, consisting of many type-different stakeholders – since relevant research shows that successful culture-based economic development should be based "on partnerships between public authorities, cultural organisations, the relevant business interests and representatives of civil society" (CSES, 2010, p.13). Thus a project consortium of 4 schools and 7 non-academic media production businesses/NGOs, coming from 4 countries was established: As arguably the most propulsive arts education player and emerging CCI production institution in Slovenia, the School of Arts at UNG started to attract partners upon an assurance of high quality management of the whole project and, along with the business school Vilnius Business College from Lithuania, its ability to provide expertise in research-based Curriculum Development (CD) to the rest of the consortium – which in terms of schools is complemented by the Instituto Politécnico de Leiria from Portugal that shows excellent business-ability results across the digital arts, and the Vilnius College of Design, another Lithuanian education player from the realm of design, with a distinctive record in design mainstreaming and spin-offs. The online platform would be developed by a Slovenian company Domenca Labs as market-leader in interactive media design that will be assisted by consortium-internal professional developers in selected areas of expertise (a Slovenian NGO LJUDMILA, Lab for Science and Art for experimental and artistic twists, complemented by a Dutch company Raycom for business and education applications) to facilitate truly inter-disciplinary and cross-culturally relevant results. The tandem of the Vilnius Northtown Technology Park and the Slovenian Venture Factory business incubator will provide a comprehensive overview of current innovation management, HRM and businessing practices and adjust these to the specific realm of CCI. They will not only contribute their trainings and materials, but also act in research functions for broadly relevant needs assessments and international analyses. The trainings and matchmakings shall be brought even closer to real-life demands by the internationally CCI-referenced NGO Museum and Galleries of Ljubljana and Triaxis, a champion company in both experimental as well as market-relevant digital media production from Portugal. These "outer", peripheral and somewhat market-deprived regions of Europe (represented by Portugal, Lithuania and Slovenia) could with such a project become more CCI-savvy, internationally integrated, and culturally contextualised, with a tendency to also promote lifelong learning (LLL) – besides and within all "businessing" issues centrally addressed. Such consortium structure might seem even more logical if one considers the fact that in several, especially new and/or peripheral EU member states "the legal and financial framework still fails to reward or may even inhibit the efforts of universities to cooperate with business." (EC, 2009, p.3)

Bound to the academic cycle, the project foresees a 3-month research-and-development stage, upon which the online platform will be developed through cross-field cooperation of several partners and beta-launched – not least answering the need for

"greater interdisciplinarity and trans-disciplinarity of education and research agendas" (EC, 2009, p.4). In the beginning also curricula will be altered (on implementation level) as to fit the first training pilots starting in the second semester, from where on the platform and curriculum development will run parallel in close connection (via dense project meetings face-to-face, all including training and matchmaking sessions). The platform will be beta-launched after a year of development, so that in the following semester the courses can be implemented in a way completely harmonized with the platform's functions and processes – but still allowing for ultimate technical improvements and gradual user training. In the last months the network will gradually expand onto further local partners in the regional nodes, while the platform is re-launched in its "2.0" development stage implying not only pilot-testing based improvements to curricula and the platform application, but also intensive expansion onto further social, education and business networks across the involved regions – gradually working towards the aim of "a regular flow of students and faculty members from university to business and a constant presence of business people on campus" (EC, 2009, p.4). Of course all the PICmediaPRO project activities will include continuous monitoring processes, coordinated by different partners, avoiding centralism and guaranteeing quality of both product and experience along the entire project process by distributed internal as well as external quality assurance mechanisms.

(HYPER)CONNECTED PEOPLE PRODUCE BETTER IDEAS (THE PROJECT'S CONTEXT)

Not only on regional and national levels, but already Europe-wide, the discrepancy of knowledge and skills actually provided by formal education on the one hand, and the real-world needs on the other, called for "A new partnership for the modernisation of universities" (EC, 2009) giving rise to a much needed EU Forum for University Business Dialogue. Indeed alarmingly, the

> "enterprises within the Forum report a mismatch between the competences of graduates as they emerge from universities and the qualifications which they seek as employers." (ibid., p. 3f).

Several realm-specific analytic studies and guidelines in the field, e.g. the green paper "Unlocking the potential of cultural and creative industries", (European Comission, 2010), the "Study on the contribution of culture to local and regional development" (CSES, 2010), the Central-Europe programme backed "Second Chance" project's best practice and SWOT analysis (Second Chance, 2011), or the "Creative Cities" (Creative Cities, 2011) needs analyses show that the realm of culture and arts is being threatened by market economies (both in terms of human resources as well as production and consumption), severely lacking the competence of entering the open transaction systems on equal terms with other disciplines. As an opportunity, the PICmediaPRO project will provide partners from schools and business with (a platform for) productive competence and international reference needed for a breakthrough on the job, the culture- and

the creative-industries markets, making positive use of the internal EU market and the digital shift.

The preceding ePlatform sought to gather the local creative energies by integrating a sustainable project process with major shifts in teaching methodology towards new media (Purg, 2010). For example, both with a promotional as well as a self-reflective aim, the project introduced to the school a novel concept of "video-scanning" (of all pedagogical meetings by students) that after a year's implementation can be estimated a clear success. Apart from discussing them at course (and academia!) meetings on- and offline, these videos are streamed through the school's custom-developed web-TV channel (a vital part of the ePlatform) alongside other video works and documentation from students, mentors and external community members. The ePlatform community embraced its "new medium" that forced the previous community (reflection) media (like e.g. blogs) "to adapt and move to a different place in the ecosystem" (Naughton, 2007, p.4.), much the same as in the fifties "television news did not wipe out British newspapers" (ibid.). In the project's external evaluation (focus group method), most teachers agreed that learners find learning more compelling when they are producers at least as much as consumers (Purg, 2010, p.3), which the students themselves confirmed later on – a clear sign of the paradigm shift from consumerism to "producerism" (Searls, 2000) intrinsic to new web technologies and practices. The school here can be considered as one of the (platform, backbone, access etc.) providers that can really enable the big shift. This important conceptual shift, based on good-practice experience, shall be accordingly translated onto the new PICmediaPRO platform's design, enabling students to promote their ideas and skills through the audio-visual medium and enter into dialog with the business and industry stakeholders.

Besides producerism, the previous project also based its premises upon the concept of "connectivism" as "integration of principles explored by chaos, network, and complexity and self-organization theories," particularly aimed at its potential of interdisciplinary discovering new "connections between fields, ideas, and concepts" (Siemens, 2004). According to its originator, connectivism is acknowledging "the tectonic shifts in society where learning is no longer an internal, individualistic activity" (ibid.). Depending on a certain grade of skill specialization, both the artistic as well as the industry-oriented (applied) practices must be aware of (and be able to map out, as the present project plan suggests) the "nodes (can be fields, ideas, communities) that specialize and gain recognition for their expertise", opening up "greater chances of recognition, thus resulting in cross-pollination of learning communities." (ibid.) Knowledge and its innovation potential is being as if stored inside social networks, dynamically within their nodes and connections, graspable only for and from the perspective of one's own position (within the network). This would mean that only the individual network members are in position to both evaluate (reflect) and promote the innovation potential of their ideas or the value of their skills – and ultimately themselves as creative or productive actors, whose intellectual property is thus transferred to

> "a flourishing non-market sector of information, knowledge and cultural production, based on the networked environment, and applied to anything that the many individuals connected to it can imagine." (Benkler, 2006, p.7)

Their position obviously needs not to be central in order to prove relevant (for a specific project-problem to be solved or skill-set to be assembled, or idea to be developed), because

> "every time users make contributions through blogs or use services that aggregate data, the network effect deepens. This network effect is driving the continual improvement of Web 2.0 services and applications as part of the architecture of participation." (Anderson, 2007, p.22)

Similar as in the existing ePlatform (showing functional lags and occasional low activity especially due to a relatively low and culture-coherent community of users) the question for the new expanded platform part remains the same as in the previous project (Purg, 2010, p.6): what is the critical mass of users in such a platform that would, according to Metcalfe's Law, rationalize relatively large investments in the development and upkeep of such an application? How to gain, keep and expand it? Or indeed:

WHY TO UP-SKILL AND MATCH-MAKE IN (HYPER)CONNECTED SPACE? (THE PROJECT'S IMPACT)

Anderson defines three significant trends in new (social) media usage that represent specific challenges for education: firstly "the crowd, and its power"; secondly the producerist "growth in user or self-generated content, the rise of the amateur and a culture of DIY;" and thirdly the supposition that the public realm and corporations shall soon "clash over ownership of the huge amounts of data that Web 2.0 is generating and the new ways of aggregating and processing it." (Anderson, 2007, p.53) Despite its increasing commodification, internet's "generativity" on the other hand can be understood as the most important leverage for the network's innovation potential (Zittrain, 2008). This is because the grid of connected computers – even in the face of all clampdown attempts – remains principally open to common and/or shared creation and enables rapid distribution (of ideas, and information about their authors, and even their references, skills etc.).

Thus, in the final stages of the PICmediaPRO project, further partners will be attracted to raise the "power of the grid" – enrich the consortium, improve its mobility outreach as well as the impact of its products. International reference of student production and employment should stimulate mobility and the platform will be seeking sustainability of mobility financing within other public and private funding mechanisms. In terms of technology, the Drupal open source web production platform will be used (again) because of its low initial cost, sustainability and flexibility allowing the consortium to co-develop, and all project stakeholders to overview, test, evaluate and start using (i.e. "grow into") the online platform. The corporate sector shall be addressed from the onset for comple-

mentary funding (e.g. fees, mobility and especially production or venture grants) and in turn seek own benefit in the form of ordering production prototypes, promotional materials and services, direct and indirect workforce recruitment, social responsibility actions etc. All these services and spin-off effects shall be promoted also to the public sector with a major difference in production focus, as ministries and production venues, galleries or festivals will be immediate users of either the programme products, or (as if) employers of its graduates.

To achieve long-lasting and future-oriented effects, emerging approaches to e-learning shall be used, incl. new (social) media such as blog, wiki, social networking/bookmarking, syndication, podcasting or streaming – all proving beneficial as tools in multi-local, asynchronous and international academic and business settings. Digital media such as videoconferencing, file sharing, mobile media, streaming video, semantic web with long-lasting social impact will be used in novel ways for CCI pedagogy. Thus the project as well as the study programme shall include regular evaluation, revision and renewal strategies to retain the technological state-of-the art character – yet not to succumb to the many digital divides of the lifelong-learning perspective. The reason behind is actually the fact that LLL "has to be developed in partnership with enterprises – universities cannot design and deliver alone." (EC. 2009, p.8) Important here is also that the structure of the existing ePlatform already supports informal learning, recognized by Siemens as a "significant aspect of our learning experience," since instead of formal education the majority of "learning now occurs in a variety of ways – through communities of practice, personal networks, and through completion of work-related tasks." (Siemens, 2004) And since one of the main goals of the planned platform development is also changing innovation management culture within the network of schools, one can indeed hope that

> "such a radical shift in the means of production will, in due course, impact on what Marx called the 'superstructure' – the culture that sits atop the fundamental economic realities of production." (Naughton, 2007, p.9)

The short term project impact is naturally oriented especially onto the 4 participating schools and the 7 participating business/NGO partners in the project's first phase, as well as their immediate academic and business environments, both in physical terms as well as virtually (network and communities). But the actual reach-out of such a project would be much wider of course: The general target user groups encompass students, pedagogical and professional mentors, production-relevant stakeholders and/as future employers, innovation supporters/users, including full- and part-time students as well as life-long learners, diverse teacher and trainer profiles, public and private art institutions, creative and cultural industry businesses, interdisciplinary r&d settings, academia networks, (educational and cultural) public administration etc. The primary multiplication target group of students is to be addressed centrally by several dissemination and exploitation activities such as local and trans-local promotional and exploitation events, online and material promotion, including a strong and manifold web presence (website with blog and RSS, social networking etc.). Teachers and trainers shall acquire important new

skills and tools for promoting innovation and talent management into their instructional designs and personal pedagogical portfolios. Ultimately, representatives from companies and NGOs shall not only learn to appreciate the sheltered academic setting as context for breeding true innovation and developing market-relevant human resources, but also up-skill themselves for tandem-structured or even individual teaching and training processes. Additional marketing in the project also aims at including a wider corporate sector from the very beginning, e. g. for granting copyright-free materials, featuring showcases as promotion strategy for companies and public institutions concerned with cultural production, and also focusing on developing industry-supported grant models for exceptionally talented students and most innovative ideas.

Students, teachers and business/NGO leaders as primary multiplication targets shall be continuously reached by standard programme-promotion activities, stressing the new-media specific promotion potential of the (multimedia, social-networking oriented, and platform-integrated) website, particularly promoting student work and their connections with employment, production and distribution stakeholders. By being (inter) regionally specific, the project will also likely create new job and mobility opportunities, lastingly retaining the youth from brain-draining the national/regional peripheries (by typically migrating towards traditional capital-city based centres for education, and to the European creative and cultural industry centres in the "wealthier" North-West). The secondary stakeholders in the relevant employment, production and distribution sectors shall broaden the network, benefitting of spin-off effects predictably occurring in external localities (school-external event organizers, media production businesses etc.) and associated partner institutions that are likely to remain in long-term partnership with the schools, but possibly develop own brands (e.g. NGOs in Portugal as festival organizers, or design industry partners in Lithuania), informal production groups becoming formalized (film crew, new media project team, event production start-up etc.). Even if of late impact, corporate funding of student access and mobility in long cycles will be sought already during the project's lifetime by presenting student ideas, portfolios as well as finished works in public productions and dedicating a part of the production process to (possibly) local public and private orders for products and services such as events, audiovisual and multimedia products, online services etc. A further long-lasting benefit is also that the project profile casts its method across CCI disciplines, and is thus not immediately related to any specific job profile (or standard), enabling the students as well as their trainers long-term employment flexibility. This is the more important since especially in the deficitary employment area of animation and new-media or intermedia arts and CCI, there is a big lack of high-profile qualifications in the addressed regions (and EU in general), not expected to be compensated in the coming two decades.

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Closer to the Edge? - Responding to the needs of Art & Design in a Web 2.0 world

Lucy Renton

ABSTRACT

This paper will mainly address the theme of 'networked spaces' but could be considered to include strands of the other themes.

My paper will present the development, rationale and wider Higher Education context of a new transferable model of 'edgeless' Virtual Learning Environment (VLE) for Art and Design, based mainly on open source software Wordpress, and BuddyPress. This model is being piloted at Kingston University for the new Design School, building on our experience of previous successful bespoke VLE developments for the School of Fine Art at Kingston, which through dialogue with staff and students have responded to the particular pedagogical structures of their open curriculum.

Previous Kingston Art & Design VLE developments gave students on those courses more personal control than the existing institutional VLE provision, resulting in positive National Student Survey comments since their introduction. Following this, we are moving to a more 'porous' integration of private logged-in areas and external-facing elements, which will link with industry, research and our developing OER provision in a more sustainable and 'future-proof' platform.

Like many HE institutions in the UK, Kingston has undergone a review of Learning Technologies, with the results of surveys and focus groups of staff and students in the Faculty of Art Design & Architecture confirming that the needs of studio-based subjects are not adequately served by the University-wide VLE systems, which are designed to deliver content for largely text-based subject areas.

Perhaps our Art and Design students are *producers* rather than *consumers* of content and thus require an entirely different paradigm?

While the new outward-facing pages of the new portal will provide pedagogical transparency to the wider world, with a closer focus on employability and Personal Development Planning (PDP) for our students, the internal group structure will place the students within the interdisciplinary community of the whole School of Design. Students automatically enrolled in project, level, course and School groups will also have the power to create their own community groups and invite others to join.

Functions that are commonly found in VLEs, installations of ELGG and Social Networking sites are augmented by specific tutorial sign up plug-ins and calendars, providing students with the opportunity for fuller control and a more personalised experience.

For our UK Art and Design subject areas to survive the coming uncertain financial climate it is vital we have appropriate and robust systems. These should exemplify to the outside world excellence in our teaching while preparing our graduates for the fast-changing and challenging workplace they will encounter. Our new development takes steps to address these issues, based on the combined input of educational e-developer, blended learning co-ordinator, senior faculty management, studio staff and students.

Bradwell, P. *The Edgeless University* London DEMOS 2009
http://www.demos.co.uk/publications/the-edgeless-university: last accessed 21.05. 2011

key words: 'edgeless', VLE, Open Source, OER, interdisciplinary

PROJECT TEAM

Lucy Renton: Faculty Blended Learning Co-ordinator for the Faculty of Art Design and Architecture, Kingston University London

Martin Rees: Consultant e-developer

Lawrence Zeegen: Head of the Design School, Kingston University London (to Sept 2011)

Simon Maidment: Acting Head of the Design School, Kingston University London (from Sept 2011)

Since 2006, the Faculty of Art Design and Architecture at Kingston University London (FADA) has continued to address the particular needs of studio-based courses through bespoke online environments, which have generated excellent staff and student feedback. Our most recent version for the new Design School acknowledges issues of future sustainability through its use of open source Wordpress and BuddyPress rather than fully bespoke coding, while modelling a more 'Edgeless' (*Bradwell 2009*) vision of linking internal and external features to showcase our pedagogies, make better links with Industry, International partners and Research, and draw alumni to the interdisciplinary community of Design in FADA at Kingston. We intend this new development to be a transferable model for other Schools that can be easily adapted and re-branded for local needs.

BACKGROUND TO DEVELOPMENTS OF OUR E-LEARNING PLATFORMS

2006 saw the start of a programme of involving FADA staff in developing more appropriate online resources for studio-based courses in response to a low take-up of our institutional VLE, Blackboard. The reasons given by staff and students for this low take-up were many, including

- worries that online technologies would mean a reduction in teachers or studio space
- poor visual appearance; University branding not suited to needs of Art & Design

- tutor-centric, rather than student inclusive
- design for content *delivery*, rather than content *creation*
- out of date in comparison to Web developments and behaviours
- creating silos in modules or courses
- lack of creative opportunities for students to shape their online environments
- lack of personalisation
- lack of features needed by studio based courses (good sign up tools for individual tutorials etc)
- lack of staff development time or funding to bring about culture change and innovation
- lack of vertical integration across levels in disciplines, and across disciplines
- lack of integration with Research staff and students
- lack of openness impeding professional contacts

These points were supported by a recent (Nov-Dec 2010) Faculty online survey and face-to-face focus groups, as part of the University-wide Learning Technologies Review. Our community of staff and students expressed a desire for significant improvements in communication across the Design School, light touch functionality combined with great useability, greater opportunities for interdisciplinary working, and more student control and student generated content; in effect, the attributes they have come to expect from Web 2.0 technologies.

From my standpoint as Faculty Blended Learning Co-ordinator since 2007, I have learned the importance of engaging all staff with simple-to-learn technologies to provide a baseline cohesive experience for all students. By defining levels of admin responsibility, training can be minimised for most staff, an important consideration where large numbers of visiting staff are employed. This opens a way to build an enriched online experience over time, and encourage staff to rethink some aspects of learning and teaching in the light of possible new arenas. My experience at a variety of institutions is that dissatisfaction with inappropriate technologies provided centrally leads 'e-pioneers' to embrace freely available social networking sites (Facebook etc.) as a replacement, with all inherent ethical and legal implications, whilst the less 'e-confident' abandon any attempt to provide online support for their students. We are at a particular moment when many older staff have had no experience themselves of learning in the computer age, yet our students are increasingly thinking, communicating and working online (Prensky 2001). Our challenge is to successfully bridge that gap, and we have found collaboration with our students in developing our sites a powerful asset.

The first bespoke developments involved Jake Abrams, (Senior lecturer in Illustration, and Teaching Fellow of the UK Higher Education Academy) who worked with Martin Rees, our e-developer, to enhance existing Blackboard provision by designing web pages inserted in the frames of the Blackboard template. Additional projects over the years brought light-hearted video tips to students on dealing with the 'crit', field trips

and the creative process, as well as adding galleries with comments for student upload of work.

The next step was collaboration with staff and students from the School of Fine Art, who co-developed a fully bespoke site with Martin and myself which responded exactly to the needs of their self-directed, Open Curriculum courses. One of the most important administrative features of this is a calendar with tutorial sign-ups which allows students to sign up for individual tutorials and keeps a record of their attendance, allowing them full access to all regular and visiting staff across multiple campus sites. This online system (which replaces time-consuming and inefficient paper sign-up sheets on multiple sites) also provides equality of opportunity to part-time students to take up these tutorials. Staff have noted that student attendance at tutorials has improved since introduction of this system. The UK National Student Survey that year recorded the following comment from a Fine Art student:

> "They got rid of all the paperwork and did more about the teaching"

Evaluation by staff and students of this interlinked set of sites covering all the courses in the School of Fine Art led to Version2, and the addition of more student-controlled features such as a student announcements area. Recent surveys of staff in FADA as part of the Kingston University Learning Technologies Review have produced further praise for these developments, and continuing positive remarks in the UK National Student Survey year on year.

> "The information we all received was accurate and informative.... The elective teaching option is fantastic and I feel I have used it as much as I could have. The course uses Study Space as much as it can and it is appreciated a lot by the students who use it."
>
> *(NSS comment 2010)*

> "Visitors, external examiners etc have all been impressed and very curious of our use of on-line resources. The external examiners in particular commented on the effectiveness on the FA site and its appropriateness of the course of study."

> "Fantastic site for Fine art, we use it all the time and it has enabled us to go paperless in the department. It is easy to use, and the students are now confident users for course information/appointments/learning materials/electives/workshops etc. INVALUABLE"

> (Staff comments, Learning Technologies Review Survey)

An appropriate School-based system offers two distinct benefits, firstly to reduce ad-

ministrative time for staff and return them to the face to face teaching which we know is most valued by students, and secondly, to enhance the opportunities for students across all levels to collaborate, share and learn from each other within and across the shifting boundaries of related disciplines. By connecting and making visible the Research work of staff and PhD students to this networked system of students studying at all levels, we aim to enhance peer learning, and aspirations to progress to higher levels of award.

CHOICE OF TECHNOLOGY

Widespread use of Web 2.0 technologies has brought about changes in online behaviours and an expectation of the ability to create and share user-generated content, which I would argue are not adequately matched by the two main VLEs in use in Higher Education in the UK: Moodle and Blackboard. Etienne Wenger's 2001 study, *Supporting communities of practice: a survey of community-oriented technologies,* includes some important points on understanding the role of technologies in building successful communities. These are still relevant despite the seismic shifts in technological innovation and moves towards open source software, so it is worthwhile to consider these again here; they form a useful checklist of functionality for any educational technology we consider using for Learning and Teaching:

TIME AND SPACE

- Presence and Visibility – A community needs to have a presence in the lives of its members and make itself visible to them
- Rhythm – Communities live in time and they have rhythms of events and rituals that reaffirm their bonds and values

PARTICIPATION

- Variety of interactions – Members of a community of practice need to interact in order to build their shared practice
- Efficiency of involvement- Communities of practice compete with other priorities in the lives of their members. Participation must be easy

VALUE CREATION

- Short-term value – Communities of Practice thrive on the value they deliver to their members and to their organizational context. Each interaction needs to create some value.
- Long-term value – Because members identify with the domain of the community they have a long-term commitment to its development

CONNECTIONS

- Connection to the world – A community of practice can create value by providing connections to a broader field or community that its members care to keep abreast of.

IDENTITY

- Personal identity – Belonging to a community of practice is part of one's identity as a competent practitioner
- Communal identity – successful communities have a strong identity that members inherit in their own lives.

COMMUNITY MEMBERSHIP

- Belonging and relationships – the value of belonging is not merely instrumental, but personal as well, interacting with colleagues, developing friendships, building trust.
- Complex boundaries – Communities of Practice have multiple levels and types of participation. It is important for people on the periphery to be able to participate in some way. And inside communities too, people form sub-communities around areas of interest.

COMMUNITY DEVELOPMENT

- Evolution – communities of practice evolve as they go through stages of development and find new connections to the world
- Active community building – Successful communities of practice usually have a person or core group who take some active responsibility for moving the community along.

(Wenger 2001 pp46-47)

There have been, and continue to be, institutional constraints to our developments, such as streamlining of Enterprise systems, which are better adapted to the needs of the more lecture driven and content rich courses in other Faculties than to studio-based creative subjects. There is a problem of conformity to corporate branding, which is an anathema to tutors who are teaching a professional subtlety of visual language specific to each discipline. Concerns are expressed by central IT to any bespoke or in-house solutions that may require staffing in future. However, the project team felt that despite the recent survey from UCISA:

> "Although Blackboard (Classic & Web CT) remains as the most used enterprise or institutional VLE, its usage has declined since 2008. Moodle has increased in usage as an enterprise solution and remains the most commonly used VLE platform at a devolved level within schools and depart-

ments. Adoption of other open source platforms is negligible across the sector."

Browne, T. et al, *UCISA survey* (2010)

-we needed to go for an open source solution. Certainly discussion forums in the worldwide e-learning community seem to favour open source platforms, with Wordpress a favourite choice as future solutions over corporate Learning Management Systems for education (The Solo Practice University has been using a combination of WordpressMU and Buddypress to create such a learning community for lawyers for nearly 3 years http://wordpress.org/showcase/solo-practice-university/). This preference connects with the movement towards greater openness on the web, and our choice of Wordpress has two distinct advantages. Firstly, there is a growing pool of educators using Wordpress, particularly in North America, Canada, and Australia, along with Art and Design examples from the UK such as the Graphic Design site at the University of the Creative Arts, http://gdnm.org/ . Secondly, in terms of sustainability, we already have a small installation of Wordpress at Kingston for simple individual blogging on the main servers, so we have some staff with an understanding of this software, and in addition, the worldwide community of developers to move with future needs by the creation of plug-ins. We continue to press the case that we should not expect our staff and students to squeeze themselves into an inappropriate system, but that we should develop agile systems that can respond to the pedagogies of Art & Design and adapt to the fast moving developments in the Web and global education markets. Without this, and an increased understanding that we need to enhance the new media literacies of our students, we will run the risk (in a very volatile funding climate for the Arts in UK Higher Education) of being left behind.

THE DESIGN SCHOOL PROJECT

It was clear to the development team that the next move needed was to make our resources even more student-centric, and with a more 'porous' relationship with the professional world. The team e-developer, Martin Rees was able to bring both an understanding of educational technologies, and his work for major commercial clients such as Eurostar and the O2 venue in London to bear on the demands of the brief set by the Head of School, Lawrence Zeegen, for an effective, professional level platform for interdisciplinary communication.

Martin addressed issues of future sustainability, the enhancement of Learning & Teaching for all courses, and the demands of the Kingston University Student Experience

Review for great online resources to support study, by choosing to adapt open source software Wordpress, already in use by Kingston on a trial basis for individual blogs. The private, logged-in areas use a groups structure delivered by BuddyPress, allowing students across the whole Design School to create their own groups, each with a blog attached. A recent survey of our students reported that they still valued a sense of institutionally owned and private space for some of their course communications. Nor were they ready for the wide-open spaces of a Connectivist approach suggested by Siemens and Downes (http://www.elearnspace.org/Articles/connectivism.htm).

To help staff and students respond to our Learning Teaching & Assessment Strategy, there are linked, public-facing areas which address Employability and Work Based Learning agendas; with Live Projects, Industry Partnerships, Placements and Funding Opportunities, and a link to the recently developed Kingston Futures site, which offers video narratives from alumni on developing their careers, along with useful links, information, job offers and news.

These externally facing pages also feature space for Design School related Research News and Information, and may also provide an ideal platform for future discipline- specific OER materials which can offer greater transparency of the pedagogies we offer, with 'tasters' of CPD and short courses. In addition, we can enhance collaborations across institutions both nationally and internationally in future. It was strongly felt by Heads of Schools through a focus group that the individual Schools each needed a cohesive presence on the web, and we feel that this model supplies such a presence. It can be rolled out across the Faculty with minor adaptations, to fit with larger strategic aims including demonstrating the impact of Research (which will be vital for forthcoming Research funding rounds in the UK), and a location to site our developing Open Educational Resources

CHALLENGES FOR THE FUTURE

Of course, our new project is neither complete nor perfect, but it is a logical and manageable step in the direction of flexibility to adapt to future needs. We believe we are taking decisions based on practical research and evaluation over a number of years with these important features

- Art & Design background, and experience of studio teaching of Blended Learning co-ordinator and e-developer
- Staff and students involved in the development process
- Responding to pedagogical needs, rather than rigid corporate delivery systems
- Positive staff and student feedback in surveys and focus groups

We still have challenges to address, including the implementation of the system for a recently enlarged Design School. We aim to move the beta project from external hosting into full integration with all other central Enterprise technologies (new this coming year) that will require substantial negotiation and planning. There is more work required to

develop pedagogy for the online environment: staff development is needed as well as a more explicit programme of digital literacy for our students, both within a constrained economic environment.

But we believe that existing Art & Design pedagogies have much to offer the wider Higher Education community, in terms of the development of independent learners and critical thinkers, with long- established studio practices of co-construction of knowledge, facilitated, rather than delivered by the tutor. This mirrors current thinking on the development of new media literacies, as expressed by Henry Jenkins in a paper for the MacArthur Foundation:

*"**Play** — the capacity to experiment with one's surroundings as a form of problem-solving*

> ***Performance** — the ability to adopt alternative identities for the purpose of improvisation*
>
> *and discovery*
>
> ***Simulation** — the ability to interpret and construct dynamic models of real-world*
>
> *processes*
>
> ***Appropriation** — the ability to meaningfully sample and remix media content*
>
> ***Multitasking** — the ability to scan one's environment and shift focus as needed to salient*
>
> *details.*
>
> ***Distributed Cognition** — the ability to interact meaningfully with tools that expand*
>
> *mental capacities*
>
> ***Collective Intelligence** — the ability to pool knowledge and compare notes with*
>
> *others toward a common goal*
>
> ***Judgment** — the ability to evaluate the reliability and credibility of different information*
>
> *sources*
>
> ***Transmedia Navigation** — the ability to follow the flow of stories and information*
>
> *across multiple modalities*

> ***Networking*** *— the ability to search for, synthesize, and disseminate information*
>
> ***Negotiation*** *— the ability to travel across diverse communities, discerning and respecting*
>
> *multiple perspectives, and grasping and following alternative norms.*"

This new platform represents just one part of the changes needed to fit the new economic, cultural, technological and global environment. It is one strand of a larger project to rethink and rebuild our Learning and Teaching spaces and pedagogies. It models our University philosophy of nurturing graduate attributes of civic engagement, to make our students confident members of local and global communities.

POST CONFERENCE DEVELOPMENTS AND FIRST FEEDBACK ON THE NEW SITE NOVEMBER 2011

The site is currently being launched and we have over 840 members enrolled at the time of writing, both staff and students have responded enthusiastically to it, and we have already found some unexpected benefits. As the VLE section of the site is linked to the externally facing pages, and being visited constantly by staff and students, we have found that the public site appears high on a Google search for 'Design School'. Partner colleges in Further Education are excited to feel more included in our community and we hope that this will mean a smoother transition for those students who complete two years of Foundation Degree and come to FADA to 'top up' to BA award by joining the third year. We have found favourable mentions of it on personal blogs by our students in their home languages.

The developing public area of the site can be visited at http://www.thedesignschool.co.uk.

The 'help' button leads to screencasts which give some information about how the private areas function.

To see a wireframe of the site and to follow developments visit Lucy's

EPADE blog/wiki http://blogs.kingston.ac.uk/ku08200/design-school-portal-development/

For reports on other e-learning projects by Lucy Renton please see

A Reflexive Archive – downloadable pdf here:

http://www.adm.heacademy.ac.uk/projects/adm-hea-projects/visual-research-projects

The Reflexive Practitioner – part of the Stepping Out project, downloadable pdf here:

http://www.adm.heacademy.ac.uk/projects/adm-hea-projects/stepping-out

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Wordpress/Buddypress in Education examples

http://wordpress.org/showcase/tag/education/

Section 4
Experimental Spaces

Open Spaces for Arts Education - The ALTO Ecosystem Model

John Casey, Wolfgang Greller, Hywel Davies, Chris Follows, Nancy Turner, Ed Webb-Ingall

ABSTRACT

Problem Area: The ALTO project (Arts Learning and Teaching Online) at the University of the Arts London has received funding in 2010 to engage the University with the rapidly growing global open education movement. This paper and multimedia prototype starts to explore the opportunities and challenges that the open agenda presents to art education institutions and those that study and work within them – as well as those outside the traditional 'walled garden' of formal education. We begin to identify and explore the intersecting topographies of the physical, social and technical spaces that are involved to discover possible sustainable paths forwards, this is especially relevant in the current climate of financial austerity.

Methodology: Our methodology is influenced by a number of approaches. Fieldworkers (as used in ethnographic and anthropological studies) are employed to understand cultures and their interactions with tools. Systems theory together with grounded theory is used to develop cohesive explanations of behaviours on which to base interventions. Our approach to technical systems design is guided by the socio-cognitive engineering methodology developed over the last 20 years or so.

Conclusions: The work of the project has involved critical engagement with current trends in diverse areas including education, e-learning, politics, informatics, knowledge engineering, economics and popular culture. As a result, we have sought to develop a simple and viable general socio-technical model for open arts education that can be adapted to fit local conditions, priorities and budgets.

Keywords: e-learning, open education, creative commons, cultural change, pedagogy, open educational resources, University of the Arts London, grounded theory, systems theory, socio-technical systems, art and design, learning design, instructional design, ALTO ecosystem, benefits realisation, design patterns, neoliberalism, tacit knowledge, interoperability

INTRODUCTION

The ALTO project (Arts Learning and Teaching Online) at the University of the Arts London received funding (JISC, 2011) in 2010 to engage the University with the rapidly growing global Open Education Resource (OER) movement. This paper starts to explore the opportunities and challenges that the open agenda presents to art education institutions and those that study and work within them – as well as those outside the traditional

'walled garden' of formal education. We begin to identify and explore the intersecting topographies of the physical, social and technical spaces that are involved to discover possible sustainable paths forwards, this is especially relevant in the current climate of cultural and financial austerity that is dominating discourse about public education in the UK in 2011.

This paper starts by describing the current software prototype in its current form with a breakdown of its components, their purposes and how they have been implemented. Next, we briefly outline the methods that we have used together with how their influences and rationales have helped in creating the prototype. After this we explore and describe the nature of some of the different spaces we have examined and traversed in the course of developing the prototype in the form of a series of reflective accounts. One of the discoveries of our work is that, of course, these spaces are really intersecting and interconnected 'dimensions' that cannot be dealt with in isolation. These reflective accounts provide both a series of 'working sketches' in words and a kind of reverse engineering to uncover the rationales behind our various design decisions to date and to help us consider how to take our work forward in the next design and development cycle. Finally, we conclude with a summary of our work and how we think the prototype may be developed further for use in arts education and in other cognate fields.

THE ALTO ECOSYSTEM SPACE

We have been developing a rich model for publishing OERs in practice-based arts subjects, which we hope to take forwards in further research and development projects. The working title for this is the 'ALTO Ecosystem' – this has the ambitious goal of creating a reusable and adaptable model for providing appropriate IT, cultural and policy support for OER development and collaboration in the Art and Design sector.

The project started with a strong focus on acquiring and installing digital repository software to handle the completed OERs, this had the secondary aim of enhancing the ability of UAL staff to manage their own learning resources internally. The repository software package 'EdShare' was chosen, a variant of the popular research paper repository 'Eprints' supplied by Southampton University. A design for the customised version of the EdShare system together with a metadata schema was developed (based on the Dublin Core metadata standard) and agreed. Repository software is optimized for storage and management and operates using a library paradigm - which is great for that particular purpose, but is not so good at presenting or publishing information. The presentational limitations of repository software became apparent in the context of ALTO and the Art and Design academic community, who traditionally place a high importance on 'look and feel' i.e. affective and usability issues. Similarly, in the wider world of OER the emphasis is much more on presentation, publication and communication. Hence, the leading initiatives do not use canonical repository software e.g. MIT OCW (previously Microsoft Content Management, now Plone), OpenLearn (Moodle), Merlot (A database driven central web site with distributed web 'feeder' sites),

IRISS, the Scottish Institution for Research and Innovation in Social Services, (Drupal).

We realized that while a repository might be a first step, it alone would not be enough, we came to understand that ALTO would need to be more than just one software tool - it would need to be a system of connected and related tools. The repository gave us a place to safely and reliably store resources in the long-term for which there was already a strong demand. But there was also a question of how ALTO might fit with other UAL information resources created by staff and projects that were being hosted on the open web outside of the official UAL infrastructure, which had been quickly blossoming over several years, often using Web 2.0 tools and services. We came to see that ALTO needed to fit into this wider and dynamic ‹ecosystem› of online resources and associated communities. Two things became clear. First, was that resources in the repository would need to be easily ‹surfaced› in other contexts in the wider UAL information ecosphere and beyond, in a variety of social media to aid dissemination and impact (not too hard technically). Second, that the other components of the UAL ecosystem might want to use the repository to deposit some of their outputs now that the possibility of a long term storage area was possible.

A good opportunity to explore this kind of connected systems approach became available through an existing UAL social media initiative called Process.Arts (http://process.arts.ac.uk/, Follows, 2011), which was the result of a staff teaching fellowship to produce an open online resource showing day-to-day arts practice of staff and students at UAL. This was set up to address the need for staff and students to display and discuss aspects of their practice as artists and designers by providing a collaborative space in an installation of the Drupal web content management system that included many common Web 2.0 features. This has been very successful in a short time, with users uploading images and videos and discussing each other's work, user numbers and interactions are high and growing with considerable interest from abroad. We realized that if the repository was the officially branded 'library' part of ALTO then UAL sites and communities such as Process.Arts would be the 'workshop' areas where knowledge and resources were created and shared. As a result, a decision to develop a socio-technical architecture for ALTO to fit into the wider UAL information ecosphere was accepted by the project board.

We think this approach represents a good path forwards for OER initiatives in Art and Design (and perhaps other cognate subjects) and recognizes the crucial importance of a contextually rich presentation layer, like MIT OpenCourseWare, with the addition of a social layer (like Process.Arts) that can also accommodate more granular resources. It›s not enough to just provide a repository mechanism of storage or retrieval (important as that may be) – the presentation and social layers enable the important human factors of communication, collaboration, and participation that are needed for sustainable resource creation and sharing within community networks.

There is an online video describing our approach to these matters recorded at a workshop session at the OCWC 2011 conference at this link http://process.arts.ac.uk/content/intro-

duction-alto-and-processarts-ocwcglobal

As at August 2011 the system consists of 4 'layers'

1) – Storage layer – Repository

2) & 3) – Presentation and Social Network Layers - Process.Arts

4) – Affiliate Layer – existing UAL websites that have adopted Creative Commons Licensing and an ALTO logo incorporating a link to a record in the repository. A schematic representation of the first 3 layers can be found below in Figure 1. A working sketch that describes the relationship of the ALTO Ecosystem to the rest of the UAL can be found below in Figure 2.

Another reason for having a social space to 'wrap around' shared learning resources is the special nature of the Arts and Art education, which tend to operate in highly confined contextual spaces. These spaces are determined by many things, such as socio-economics, political ideology and culture(s) and in these space it is challenged to distinguish itself from the 'ordinary'. Arts artefacts need to be embedded in a relevant context - else it is not Art, but a consumer object. Sculptures and installations of scrap metal need this context badly to be recognised as Art and not as a scrap heap. The context is often created by a physical space (museum, public square on a pedestal, gallery, etc) or social value (famous Artist, Architect, Brand Designer). Sharing of Arts and Design artefacts in digital form, therefore, depends much on the meta-contexts that can be associated with them. One way to investigate this further is to explore the sharing of such artefacts between different cultures, to see what kinds of meta-contexts are used.

Future Work

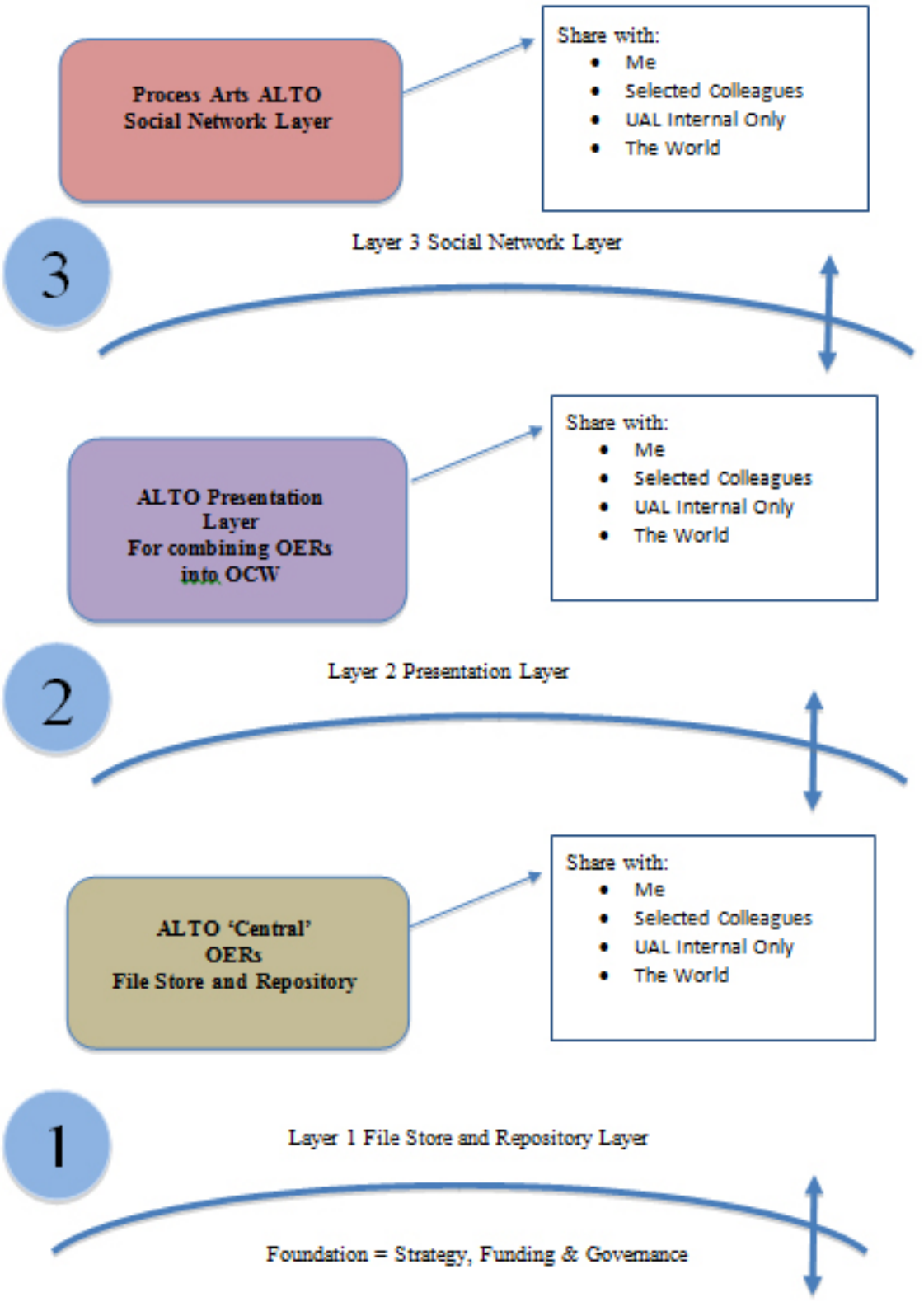
The ALTO ecosystem model is useful only in so far as it helps us to understand the organizations we work in and communicate our ideas. There can be a tendency in the educational technology field to try to replace reality with abstract models. As work proceeds we shall need to take a critical approach to our own model and change it as circumstances demand.

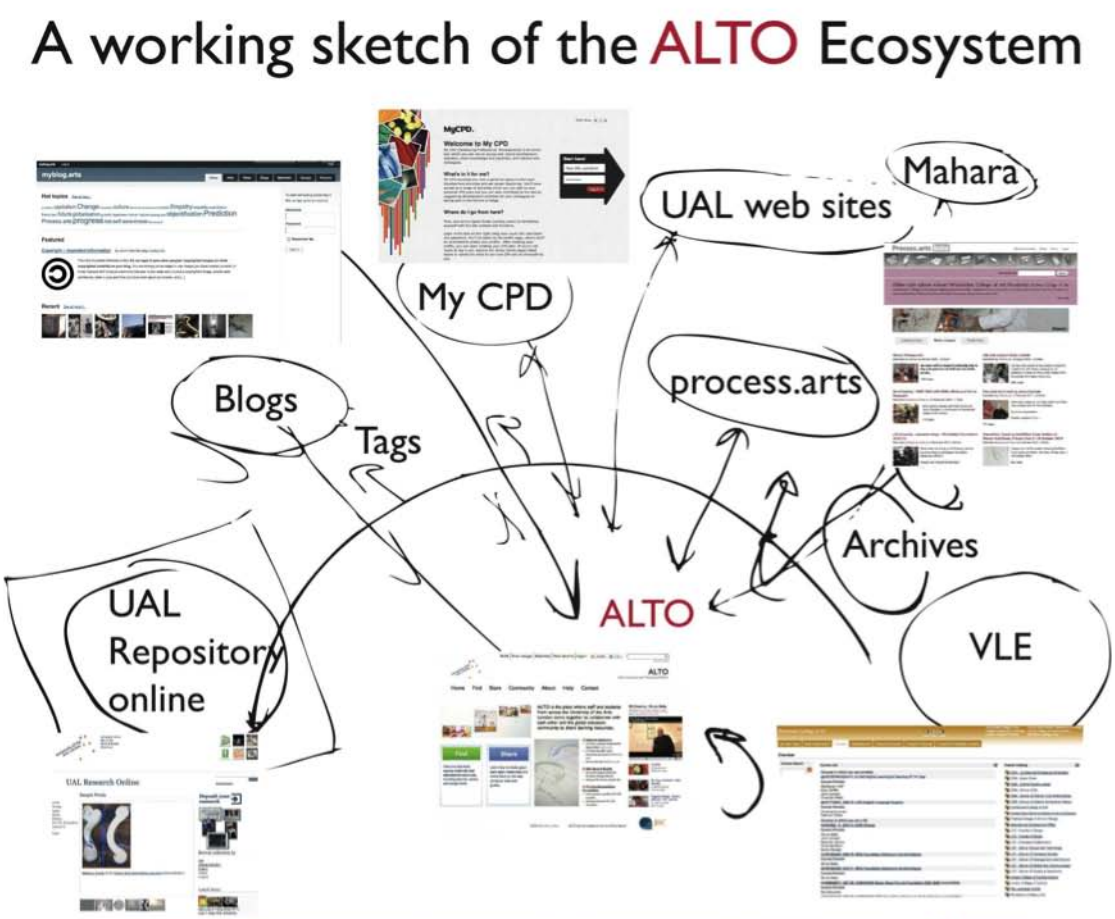
Next Page

ALTO Ecosystem: schematic representation of the first three layers

Following Page

Working sketch of the ALTO Ecosystem related to the rest of UAL


Process Arts ALTO
Social Network Layer
Share with:
Me
Selected Colleagues
UAL Internal Only
The World
3
Layer 3 Social Network Layer
ALTO Presentation
Layer
For combining OERs
into OCW
Share with:
Me
Selected Colleagues
UAL Internal Only
The World
2
Layer 2 Presentation Layer
ALTO 'Central'
OERs
File Store and Repository
Share with:
Me
Selected Colleagues
UAL Internal Only
The World
1
Layer 1 File Store and Repository Layer
Foundation = Strategy, Funding & Governance


A working sketch of the ALTO Ecosystem
UAL web sites
Mahara
My CPD
process.arts
Blogs
Tags
Archives
ALTO
UAL
Repository
online
VLE

METHODOLOGICAL SPACES

Grounded Theory

Grounded theory[1] consists of looking for commonly recurring patterns of activity and behaviour in order to understand how people and organizations work. Our project did not have the time to carry out an organized in depth indexation and taxonomy of observed behaviours of UAL academics in relation to their activities in relation to the design, development, sharing and reuse of learning resources. It is worth noting that, to the best of our knowledge, this kind of study on any scale has not been done before. This is notable because in over 15 years of UK government expenditure on technology enhanced learning the emphasis has been on the creation of digital learning content but there has been little apparent basic 'market research' about existing user behaviours and attitudes to sharing and reuse of learning resources. Instead, policy and strategy seems to have been based on sweeping assumptions that users are already sharing and want to share resources, Pollock & Cornford (2000) provide a useful analysis of the trend for rhetoric to replace evidence in e-learning development.

We adopted a sceptical attitude to the claims made by the e-learning 'establishment' in the UK that sharing and reuse of learning resources was a common activity amongst university teachers. Our own experience and that of our networks of colleagues suggested that this assumption was not always well founded and highly dependent on context. This echoes recent discussions in the international OER community that while many open resources are being created not that many people are actually reusing them (UNESCO 2005, Chow 2010). Rather, the pattern has been that OERs are created in the in the developed world and consumed in the developing world – the MIT OCW initiative being a classic example.

Future Work

With economic austerity being the rule in the developed world there are now strong economic reasons for advancing the OER agenda 'at home'– the open textbook movement in the USA being a classic example (Chow, 2010). But, for sharing and reuse to take off in the UK and elsewhere we think much more basic empirical research needs to be done into how teachers actually design, develop, use and share learning resources as well as into their attitudes and values in relation to sharing and reuse.

Systems Theory

Universities and Art Colleges are complicated organizations that can be both highly resistant to change and reluctant to accept any shareable representations of their internal functionality. Modern systems theory can offer some help, to those engaged in change activities in universities. It provides some useful analytical tools for identifying and un-

1 http://en.wikipedia.org/wiki/Grounded_theory

derstanding the dynamic relations between the different components of such organisations. Senge and Sterman (1994) develop this theme in the context of Organisational Learning - a concept, which is of growing in interest in the business world, it is worth briefly looking at some of their recommendations. They propose a 3-stage process for developing a better understanding of how an organisation actually works by the people within it:

> "1/ Mapping mental models - explicating and structuring assumptions via systems models;
>
> 2/ Challenging mental models - revealing inconsistencies in assumptions;
>
> 3/ Improving mental models - continually extending and testing mental models."

They make the important point that flaws in the understanding of how an organisation works cannot be corrected until they are made explicit, which is the purpose of the modeling exercise.

Future Work

Introducing OER activity into a university involves encountering and dealing with different mental models of how the institution is structured, how it works and what its purpose is. These models can be quite varied and even conflicting, as a result we have found a need to create our own 'meta model' that is capable of containing other models as reference points. This is important, because much of the work involved in introducing OER activity into a university is in dealing with cultural issues. We will need to articulate our meta model as we go forwards and test it out with users to see if it is of use to them. We shall need to bear on mind that this is a highly contested space internally and externally, a point made forcefully by Barnett (2003).

Benefits Realisation

The ALTO project had as one of its high level aims to link engagement with OER to a process of educational culture change across the institution. Under the guidance of the project director, we were encouraged to look for opportunities to embed the benefits of OER engagement at the UAL and at the systemic nature of the obstacles to longer term change that were involved. To do this the project team engaged with the institutional context early by holding a benefits realisation2 workshop with key UAL stakeholders; this has resulted in a set of simple 'statements of principle', which provided a sound foundation for the project (http://blogs.arts.ac.uk/alto/about/). The underlying driver behind the benefits realization managerial philosophy is that past experience in implementing change shows that many projects succeed in meeting their objectives but fail in making a lasting change on the host organization. A tendency that might be described as

2 http://www.gowerpub.com/pdf/SamplePages/Benefit_Realisation_Management_Ch4.pdf

'tactically correct but strategically wrong' or more prosaically as the 'tick-box approach' where participants lose sight of the big picture and fail to seize opportunities for fear of deviating from the plan. This is a mind set that can be prevalent in the UK public sector dominated by central planning and target setting. In the context of IT projects this tends to manifest itself in a top-down linear narrative that becomes entrenched very early on, often articulated by external 'experts', quangos and consultants. The net effect of this can be a denial of the lived reality of the people for whom the system is being designed to help, with discourse amongst 'experts' being substituted for reality. This in turn, not surprisingly, tends to produce inflexible software development methods (epitomized by the classic 'waterfall'3 model of software development). These are well known problems in the software industry and the textbooks are full of case studies recounting famous project failures that met their objectives (Glass, 1997). The recent multibillion-pound UK NHS database system failure is a classic example of these trends combining4.

Future Work

Because of the factors described in this section it will be necessary to explicitly plan for the 'unexpected' in the project documentation to any funding agency, in order to create a 'space' in the planning methodology for deviations from the plan.

Socio-Technical System Design

Another major methodological influence on the project came from the socio-technical systems5 design tradition originated by researchers at the Tavistock Institute in London and described by Enid Mumford (1995) in a number of studies involving the effective introduction of technology in the workplace, originally in the context of heavy industries like coal mining after the second world war. This approach has since been adapted successfully for the introduction and adaptation of information technologies into the modern knowledge-based workplace. Notably by, Sharples (2002) as 'Socio-Cognitive Engineering' and Wenger (1995 & 2009) as 'Communities of Practice' and 'Technology Stewards'. These approaches draw on traditional ethnographical approaches, where project fieldworkers interact with the groups under study to understand better how they work and live. This information is then used in the iterative construction of prototypes that are tested with people to understand how the tools and system may be improved. One way of describing this approach is that it is investigative and human-centred as well as contextually and culturally sensitive. This does not mean, however, that it is neutral. Sharples (2002), is explicit about the interventionist nature of this methodology i.e. it has a strategic dimension that is aimed at changing the way people interact with each other and their tools in knowledge working. Thus, user accounts and 'official lines' are not taken at face value and the aim is to seek to understand how people and organisations really work and function in relation to their stated aims in order to improve them.

3 http://en.wikipedia.org/wiki/Waterfall_model
4 http://www.guardian.co.uk/commentisfree/2011/aug/03/nhs-database-digital-disaster
5 http://en.wikipedia.org/wiki/Socio-technical_systems

Future Work

These approaches have a great deal in common with some of the classic approaches to product design as described by Don Norman (Norman, 1999) and Achille Castiglioni[6] (Antonelli, 1997) and it will make sense to see our work as designing a suite of products to help teachers (and students) to design, develop, share and adapt learning resources.

Agile Software Development

An important influence on our methodology was that of agile software development[7], which developed in reaction to the failure of traditional top down methods of software system development and management in the software industry to deliver usable and successful solutions to peoples needs. In this approach basic assumptions are questioned, problem areas are targeted early on and rapid early prototyping is used, continuous user testing and evaluation are also features of this approach to system design.

Future Work

Agile software projects, especially in the higher education sector, can become detached from real users and end up as interesting projects undertaken just for their own sake. To prevent this happening we shall need to have a strong end user focus, this will be achieved by regular meetings with real end users to test ideas and system prototypes. The project team will also have one or more 'user advocates' to represent user interests.

PHYSICAL AND POLITICAL SPACES

In City of Quartz: Excavating the Future in Los Angeles, Mike Davis (2006) describes the spatial politics and economics of modern Los Angeles and how architecture and city planning is used to control and influence the movement and congregation of individuals and groups to project and protect the power of ruling interest groups. In his analysis, Davis stresses the contested nature of 'public space' and the threat they pose to those in authority, resulting in the continual need to devise and implement means of observation and control over such spaces in order to respond to initiatives from below.

In terms of physical space, university education over the last millennia or so has been conducted in closed spaces exemplified by traditional campuses and buildings with strong regional and national connections to ruling social groups and their values. The pattern has remained remarkably consistent in the recent expansion of the university system in the UK through the 1990's and 2000's. This political and physical organization of universities has tended to preserve and perpetuate certain modes of education and cultural forms that produce conservative attitudes and highly entropic (resistant to change) professional and institutional structures and cultures. One example of this is the continued dominance of the physical university lecture hall /studio as the location

6 http://designmuseum.org/design/achille-castiglioni
7 http://en.wikipedia.org/wiki/Agile_software_development#Agile_Manifesto

of teaching. As Laurillard (2002) observes, the university lecture format was devised as a medieval lecture tool to efficiently transmit information in an era when books were expensive and in short supply. Yet the lecture format continues to dominate and universities are building ever-larger 'mega' lecture halls to cope with the ever-increasing size of classes (Shmier, 2011). There are two powerful drivers for this:

> 1) The commodification of UK education, where the cost of teaching is transferred from general social taxes to individual payment, which makes change more difficult as students and their parents demand traditional lectures because that is what 'proper' higher education is popularly perceived to be.
>
> 2) The dominant educational philosophy supporting undergraduate education was developed to meet the needs of a small elite (the children of the medieval aristocracy).

Meeting the challenge posed by i) is difficult where the prospective students and their families see college education as a part of the socialization process for middle and upper class youth and those aspiring to join these classes. This is much less of a problem for other demographic segments (to use the language of neo-liberalism) where students have more pragmatic aims. In that situation, branding and product development are capable breaking free of the lecture model. The open and distance learning sector as exemplified by the Open University in the UK and the University of Phoenix in the USA draw on a well established educational tradition going back to the correspondence courses of the 19th Century.

The challenge posed by ii) is a bit trickier. Laurillard (2002) approaches this by suggesting that the model of undergraduate education in the UK be changed from the idea that students and teachers are jointly constructing new knowledge in a domain. Instead, she asserts, students are in fact learning knowledge that is new only to them, and that the aim of teaching is to bring student understanding up to a level where they can participate in a cognate community. In this educational model, new domain knowledge is only encountered and created in postgraduate education.

The underlying educational philosophy governs how technology may be used in the educational process. Peter Dicken (2010) provides a useful insight into how our different conceptions of knowledge affect how it can be shared; he splits knowledge into 2 types:

> 1) Codified (or explicit): the kind that can be expressed formally in documents, plans, drawings, software and hardware etc.
>
> 2) Tacit: deeply personalized knowledge possessed by individuals is virtually impossible to make explicit and communicate to others

As Dickens observes, this distinction is fundamental to understanding the role of space and place in the technological diffusion of knowledge, with tacit knowledge having

a very steep 'distance-decay' curve, while codified knowledge can be projected relatively easily across time and space. But, Dickens also cautions, this distinction can change in a number of ways that can make tacit knowledge more easily exchanged at a distance. One way that springs to mind that may be used to communicate tacit knowledge is the use of rich media, such as video or animations, that convey a sense of 'being there' and can have a persuasive rhetorical power to convey not just ideas and concepts but also affective and cultural factors (Laurillard, 2002). Another, more radical, observation is that in higher education in Art and Design much tacit knowledge perhaps isn't really tacit at all. Rather, the assertion that the knowledge involved is tacit may be a strategy to preserve the mystery and exclusiveness of the 'secret garden' of formal education. Jennifer Moon (2002) provides a good example of the latter in connection with her experiences as an educational developer in the UK, during the 1990s citing the anguish that the requirements to create clear learning outcomes caused to some university teachers.

> "The ideas that learning [and by implication teaching] can be described at all can generate quite amazing angst….At the time, there were still lecturers who would say, 'I don't want to think in advance about what I am going to teach. I will decide when I get in with the class.' The same lecturers would also say that they would decide on the assessment when it came to the end of the term or semester, and that they did not to discuss levels or standards because they would know a good or bad piece of work when they saw it."
>
> (Moon, 2002, p 9)

Future Work

We will need to be aware of the contradictory and paradoxical nature of universities engaging with the open education agenda. In many ways universities represent an education model based on scarcity and elitism while the open model is based on abundance and equality of access. There are clear parallels here to the underlying contradictions of neoliberal economics where, despite great and increasing wealth and productive capacities, human society is marked by increasing inequality (Harvey, 2007). The potential of open public spaces (both physical and online) to act as a conduit for social change are considerable, as Davis (2006) observes. Linking universities to such spaces and engaging with OERS can be seen as both extending the reach of the traditional academy and at the same time subverting it and, potentially, reforming it. In the process, institutions that are so place-based as universities run the risk of exposing practices and values that make little sense to the outside world. But, as prestigious institutions, they can also project their brand and values into an increasingly global education market. Sharing OERs can act as a valuable and low-threshold way of joining global collaboration networks as the Open University has found (Lane et al, 2009). Engagement with the open education agenda can also act as a powerful driver for cultural change in university teaching practice by reducing insularity and opening the door to innovation and collaboration with

others, both internally and externally. What kind of cultural change is a key question that needs to be clearly articulated if institutions are to benefit from involvement in the open education agenda.

EDUCATIONAL SPACES

Perhaps the biggest reason for teachers (and their institutions) to be involved in OER creation and sharing is the improvement in teaching quality that this may bring. Biggs (2006) and Ramsden (1992) both make the point that everyone has an implicit personal theory of teaching and learning and that the first step in the process of improving teaching is to start to externalise these internal conceptions in order to change them and learn from others. In his influential book, Learning to Teach in Higher Education, Ramsden (1992) outlines three theories of teaching in HE that co-exist and build upon each other in a hierarchical manner. They also nicely represent the stages a university teacher progresses through as their pedagogic expertise improves, as well as providing useful ways of analysing the proposed and actual uses of technology to support teaching. These three theories see teaching as concerned respectively with:

1. Delivering content
2. Organising and supervising student activity
3. Teaching as adapting to circumstances and context in order to make student learning possible

From this perspective much existing OER activity is currently to do with level 1. Addressing level 2 may be possible by developing sharable lesson plans or learning designs and design 'patterns' as developed in the field of architecture by Alexander (1979), the European E-Len project gives a nice introduction to this field[8] and in the UK Laurillard and colleagues at the Institute of Education in London have been researching this area'[9]. But, externalising and sharing knowledge at the third level of Ramsden's model can be particularly tricky in practice-based subjects like Art and Design that are often highly dependent on cultural context and teachers personalities. In many ways this is a classic example of the problems of dealing with tacit knowledge; how can we represent and share such knowledge and share it, and even assess it?

De Corte (1990) provides a useful general description of the nature of the knowledge needed to underpin expertise in a domain that is also useful to frame a discussion about how to share it:

a. The flexible application of a well-organised domain-specific knowledge base, involving concepts, rules, principles, formulae and algorithms etc.
b. Heuristic methods.
c. Metacognitive skills

8 http://www2.tisip.no/E-LEN/info/e-len-leaf2.pdf

9 Overview of learning design patterns from Diana Laurillard http://www.youtube.com/watch?v=97NjUUAdyq0

d. Learning strategies that learners engage in to acquire the preceding types of skills.

The field of design studies may help us in developing ways to share the heuristic and metacognitive aspects of such expertise. Donald Norman (1999) has written a classic account about this in The Design of Everyday Things, there are some important ideas in his text quoted below in relation to understanding the nature of the pedagogical knowledge of teachers. Norman makes a strong and useful case for the understanding the situated nature of such knowledge:

> "A major argument [in this book] is that much of our everyday knowledge resides in the world, not in the head. This is an interesting argument and, for cognitive psychologists, a difficult one. What could it possibly mean for knowledge to be situated in the world? Knowledge is interpreted, the stuff that can only be in minds. Information, yes, that could be in the world, but knowledge, never. Well, yeah, the distinction between knowledge and information is not clear. If we are sloppy with terms, then perhaps you can see the issues better. People certainly do rely upon the placement and location of objects, upon written texts, upon the information contained within other people, upon the artefacts of society, and upon the information transmitted within and by a culture" (Norman, 1999, p. xi)

Future Work

The educational benefits for engagement with the open agenda are strong and need to be made explicit going forwards. It is precisely the situated, embedded, tacit and 'craft' aspect of teaching in mainstream art and design that needs to be comprehended in order to both understand and improve it. By engaging with OER creation and sharing, especially with a combination of rich media and practice-based accounts as exemplified in Process.Arts, we effectively open a door into this hitherto secret garden of educational practice. There is plenty of research support for this approach; Wenger (1998) calls these accounts 'boundary objects' that enable different communities of practice in the same subject (and even between subjects) to communicate meaning across the boundaries of different contexts. More recently, Conole (2008) and colleagues in the UK Open University and elsewhere have called these kind of resources 'mediating artefacts' for their ability to carry pedagogic meanings across institutional and national boundaries. Lastly, Paivio (1986) makes a good case for the inclusion of rich media in such artefacts as a way of aiding understanding, as part of his 'Dual Coding' theory.

LEGAL SPACES

Levels of awareness about copyright and other Intellectual Property Rights (IPR) amongst academics are fairly low. Engagement with OER creation forces individuals and

institutions to reexamine their attitudes and policies regarding the ownership of IPR in scholarly content. Traditionally, in the UK, ownership of such content has been passed over to commercial publishers in the form of articles for research journals and student textbooks.

The relationship with commercial academic publishers has become unbalanced over the last two decades with the prices of research journals and textbooks rising far more rapidly than inflation. This has led to the common situation that university libraries can no longer afford to buy back their own research for their students to read. In many ways this sums up the progress of neoliberalism[10] over the same period, with the rising dominance of property rights to the exclusion of other rights and increasingly severe laws to protect and extend the rights of property in the digital domain. There is a clear parallel here to property law development and enforcement in 18th century England (Corrigan & Sayer,1985).

Left to its own devices neoliberalism tends to strangle the sources of its own wealth – the creative ability of individuals and society. In reaction to the unbalanced use of IPR law by commercial publishers the Creative Commons organization (http://creativecommons.org/) proposes a simple set of legal tools to empower individuals and organizations across a wide range of activities to manage the IPR in their own creative outputs. This initiative has been extraordinarily successful and has been adopted around the world, showing evidence of a common need. The ALTO project has been using the licences developed by the Creative Commons, without which, it is fair to say, much of our work would have been practically impossible.

A legal innovation that the project has implemented has been the use of a customized version of a Creative Commons licence to support sharing just within the UAL, which has also introduced the valuable concept of the 'UAL Commons'. This is modelled on earlier work in Canada in the state of British Columbia (https://creativecommons.org/weblog/entry/26963) this licence was based on the Creative Commons BY-NC-SA licence with additional restrictions to restrict use to within the UAL. This addresses the issue of building trust between the staff from the six highly autonomous individual colleges that constitute the UAL to support inter-college sharing.

Future Work

A simple but vital aspect of future work in this area is providing access to awareness

10 For those readers who are new to the subject of neoliberalism this entry in Wikipedia gives a good start: http://en.wikipedia.org/wiki/Neoliberalism. The A Short History of Neoliberalism by David Harvey, Oxford, University Press, give an excellent introduction to the economics and politics of the subject especially covering the globalisation phase. For those readers interested in the current and future trajectory of neoliberalism then this entry in Wikipedia is the place to start: http://en.wikipedia.org/wiki/Financialisation the book Meltdown: The End of the Age of Greed (Verso) by the BBC economics editor Paul Mason give a highly accessible introduction to current trends.

raising learning resources for academics and students about the legal aspects of OER engagement – possibly making this a mandatory part of teacher training.

TECHNICAL SPACES

Pioneering work about introducing technology into workplaces by Mumford (1995) and others has long since shown that successful innovation always has to address the contextual and social aspects of using the new technologies. This applies especially to HE organisational and teaching cultures, which can be notoriously resistant to change, with and without technology. Until recently in the UK work in the area of sharing and reusing learning resources has been dominated by technological concerns with interoperability standards, learning objects, metadata and the creation of specialist repository software – sometimes becoming an end in itself rather than linked to real users (Barker, 2010). There was a genuine belief amongst the 'experts' that if this were done according to the technical specifications then everything else would work. But, things have not worked out as expected, Fini (2007) describes it this way:

> "This way of interpreting e-learning is running into a crisis: the promised economic effectiveness of content re-use is often hard to demonstrate or it is limited to specific contexts, while a general feeling of discontent is arising."
>
> (Fini, 2007, p. 5)

To understand this apparent impasse Friesen (2004a) and Friesen & Cressman (2007) helpfully point out there is a set of important political and economic sub-texts connected to the proposed uses of technical standards and technologies in education that need to be explored and challenged. Neglecting such 'soft' issues is a major cause of the problems cited above by Fini (2007). While Harvey (2007) notes a prevailing belief in neo-liberal thinking that there can be a technological fix for any problem and that products and solutions are often developed for problems that do not yet exist. In education, one of the materializations of this tendency is in the proposition that interoperability standards and techniques developed in the military and aviation sectors can be adopted in the mainstream public education system (Friesen, 2004a). But, despite the large amounts of money spent by public bodies in this area, Friesen (2004b) notes that there has not been wide adoption. In retrospect it is not surprising that standards and approaches that developed in the last century and originating in the military and industrial sectors have not taken root in mainstream public education systems; here teaching and learning is, inevitably, a far more messy, less controlled and contingent enterprise. Wilson (2009), who has been involved closely in the standardization development process, reflects on this state of affairs and suggests that that there is a need for a more lightweight approach such as epitomized in web technology standards. Elsewhere, Hoel (2010) who has also been involved in developing educational interoperability standards is bleaker in his assessment stating "the interoperability standards in the LET [Learning Education and

Training] domain failed miserably". Although the mood swings in the educational technology community can sometimes resemble those in the merchant banking community (from 'master of the universe' to deep despair) we need to remember that innovation is often a dialectical process and rarely proceeds in a straight line – especially once people are factored in. Casey and Greller (2007) provide a more sanguine longer-term view of these developments and suggest that some of these technologies may yet be adopted in unanticipated ways.

Future Work

We need to be aware that the underlying philosophical framework of those building technical tools in this area will determine the success or otherwise of the outcomes. Whatever the technical solutions that are developed, they should help and not hinder the activities relating to the design, development and sharing of learning resources. The guiding design principle for these socio-technical systems need to have a clearer philosophical basis rather than the currently dominant techno-centric abstractions, which often disguise a rather impoverished view of education and society. We think the guiding principles for system design should be based on the concepts of conviviality (Illich, 1973, Hardt & Negri 2009) and stewardship (Wenger et al, 2009). The tools developed should be based on truly free and open source software that is robust, easy to use, and is well documented[11].

CONCLUSIONS

The work of the project has involved critical engagement with current trends in diverse areas including education, e-learning, politics, informatics, knowledge engineering, economics and popular culture. As a result, we have begun to develop a simple and viable general socio-technical model for making tools to support open arts education that can be adapted to fit local conditions, priorities and budgets. Developing this paper has given the project team an opportunity to reflect on their work so far and begin planning for future developments.

ALTO, in many ways, represents a nexus between the traditional 'walled garden' approach to arts education regulated by national authorities and more open forms of educational practice. In many ways there is nothing new in the concept of open arts education, the academy has always been influenced by external developments and movements – sometimes resisting and sometimes embracing change.

11 NB not all software that claims to be free and open source actually is, the phrase is sometimes used as a feel good marketing ploy.

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Good Guys Are Handsome and Bad Guys Are Ugly in Entertainment: Could There Be a Serious Application in Education?

Juha Keinänen

ABSTRACT

Let us assume that particular traits of male and female beauty are sources of meaningful signals and some of these signals have already been effectively exploited in media entertainment, such as movies, animated films and cartoons. Then, an intriguing question emerges: could there be a serious application as well—particularly in electronic learning? My hypothesis is that the appliance is possible using a humanized and animated digital character that provides instruction by shifting its shape from beautiful to ugly and back. In essence, beautiful form would carry a positive import and ugly negative. Anyway, appearance is put into use instead of any natural language since it is assumed that various beauty traits are universal. If so, it would follow that the import of these signals would be instinctively grasped by everybody everywhere. As a consequence, the application would work worldwide without localization.

Keywords: beauty, ugliness, humanizing, character design, instruction design

INTRODUCTION

This text is constructed roughly of three main topic areas: first, the importance of beauty; second, the description of beauty; and finally, a sketch of an instructional application. But first, let me start by asking a question: what are the most important things in life? Well, supposing that a person has any life experience, the answer would most likely include health and children at least. Now, keeping this in mind for a moment, the next question would be: what has beauty to do with it and why should we judge beauty important? Before making an attempt to answer, let us take a peek into the past.

Historically, beauty has been a concept that has suggested a legion of meanings (and it still does), pointing either to concrete things, practices or even personality traits (e.g "innate" beauty). The uses of the concept differ culturally as well and in this sense beauty appears as hazy as the concept of "art", for example. Joe Winston gives an enlightening historical tour. First, for Plato beauty was "not dependent upon physical appearance but on how this reflects inner virtues of character." And for Kant too, beauty did not reside in the features "of objects themselves; instead, it was a judgement located within the human mind that expresses a particular experience of pleasure..." Winston maintains

that some of the later developments of the concept include the modernist turn, where beauty, instead of depicting it as "sensual and pleasurable", was portrayed as "frightening, bestial and ugly." And kitsch, once again, turned beauty into some "corn-flake" realism. (Winston 2010, 19-40.)

As a consequence of all this fuzziness, beauty has become elusive as a concept. But it does not follow from conceptual vagueness that things would be blurry in reality. In fact, I agree with Arthur Marwick when he notes: "What people like doing, of course, is muddling things up together." And he continues: "'He's a beautiful man' can actually mean 'he's wonderfully kind and likeable…though not actually physically very attractive." Marwick adds that his own study of the evidence makes him "not greatly impressed by the oft-repeated accounts of African tribes prizing fatness, South American ones lip plates, Burmese ones necks stretched and ringed like a snake—in these examples the admiration is for symbols of wealth and status, not beauty. Indeed the whole subject is bedevilled by an elementary failure to distinguish between fashion and beauty." In consequence, Marwick has come to the conclusion that beauty proper "is an attribute purely of face and figure" and it has not changed much over ages, being "'relative constant'", or "'relative universal'." (Marwick 2004, ix-x.)

But, before going any further, let us halt for a moment to consider one peculiarity in the reservoir of ideas (or philosophy). Namely, if beauty is important, why is the topic almost entirely absent from the agenda of contemporary philosophy then? Well, it seems possible that this disinterest may result from attitudes. Nancy Etcoff has noted that intellectuals would like us to trust that beauty is unimportant and thus useless "since it explains nothing, solves nothing, and teaches us nothing, it should not have a place in intellectual discourse." But, Etcoff continues: "There is something wrong with this picture. Outside the realm of ideas, beauty rules. Nobody has stopped looking at it, and nobody has stopped enjoying the sight." (Etcoff 1999, 4.) Well, we shall see, since in this project I will provide evidence for or against the value of beauty by putting it into an experimental test in the territory of education.

When I started my study on beauty, I first thought that surely I will find my material from the libraries of art schools. Much of my surprise, though, I soon found out that this was not the case. However, I noticed that the topic has been popular elsewhere: namely, in fields such as medical science, sociology, psychology and anthropology. During my preliminary research I also found one interesting approach to the topic, i.e. an approach informed by the theory of evolution. In fact, I found this intriguing especially because the evolutionary theory has the potency to explain the existence and importance of beauty. Moreover, I came to realize that there may be some utilities in design as well. But let us return to beauty yet again.

Surprisingly, some researchers have suggested that traits of beauty may well be signals of good health, among other things (e.g. Sugiyama 2005). What is important to understand in this respect is that we do not actually need to consciously recognize this

"health-function". This is because nature has arranged it so that we recognize beauty instead—quite like we taste the sweetness of sugar without the need to understand that it is energy. Hence we automatically appreciate the "sweetness" of beauty as we appreciate the sweetness of sugar.

Now, in the light of what just has been said and presuming that we value health—especially the health of our children—would it be reasonable to consider beauty important? Firstly, it is a well established fact that our physiological traits have the potency to pass down to our children. Secondly, if beauty traits are physical and they are signs of health, health is also likely to pass on. This even includes mental health; for if it was not physiological in origin, it would be hard to explain the effectiveness of mental drugs, since they are composed of mere molecules. Now, to answer the question whether beauty is important or not: in the matter of fact, beauty may be among the most important things in life. This is because beauty seems to be linked to our health and that health has the potency to pass down to our children. In other words, beauty is possibly nature's own health insurance for our babies. And what would be more important than the well-being of our children? Well, maybe I made a point. I will leave this subject now and turn to the form and anatomy of beauty.

THE MORPHOLOGY OF BEAUTY

It is imperative to understand first that I am only dealing with the traits of human face and body in this study. Moreover, I am merely interested in a set of traits that is hypothesized to be universal (or recognized by all). As a result, I will not deal with fashion, cultural traits, artificial ornaments, artefacts, natural objects or animals—along with any "beauty" values that people attach to them. In effect, this study is about natural human beauty where all artificial is stripped off (e.g. make-up, ornaments and alike). And since I need something tangible to model and build my application, I have sought for an approach that deals with these issues on a pragmatic level instead of merely conceptual one. For these reasons I have chosen a somewhat non-traditional approach, namely one that may be called "evolutionary aesthetics" (e.g. Voland and Grammer 2003). It is informed by evolutionary psychology, which on the other hand stands on the tripod of modern psychology, modern neuroscience and the theory of evolution.

In any case, I regard beauty as a form of physical attractiveness that everyone recognizes instinctively worldwide. The explanation for this kind of global recognition is that the capacity is biologically inherited and spread everywhere in the course of human evolution (e.g. Cunningham 1990 and 1995; Sugiyama 2005; Voland and Grammer 2003; Barkow et al. 1992; Tooby et al. 2005). I also suspect that this recognition has an emotional basis, although this is not yet confirmed (emotions are taken as fast decision-making mechanisms that have a biological origin, e.g. Ekman 2007).

Now, the psychologist Lawrence Sugiyama has done an extensive survey among anthropologist studies to map the attractive features of human face and body. This material

reveals substantial cross-cultural agreement on what is generally considered attractive. In addition, it has also been established that even newborn babies can make the same judgments as adults. As Sugiyama (2005, 295) notes, this is "not easily explained by cultural learning theories." What it implies then is that these traits are likely to be biological in origin and therefore products of evolution. But before going into the traits themselves, let us first contemplate one question that cannot be evaded.

Namely that the ever so popular relativistic view—dealing with cultural differences—seems at first collide with the view that universals exist. But as the anthropologist Donald Brown (1991, 88) has noted: "Given the inherent tendency for disparate peoples to develop disparate cultures, how on earth can some things be the same everywhere?" To be sure, I will take the middle way and submit that both cultural and universal go hand in hand. But how can this be in practice? Well, the researcher Christopher Berry has formulated an answer: "Humankind possesses some common attributes. This view…does not claim that all humans are identical. Indeed…there are differences among humankind." Then he makes a revelation: "The essential claim is therefore that these differences do not destroy universality but overlay it." (Berry 1986, 58.) What this suggests is that since our differences seem to cover our similarities, it is easy to miss similarities altogether—especially if one has already been conditioned by the relativist program. But enough of this and let us turn back to beauty.

To begin with, it appears that the characteristics of beauty may generally be divided into a few traits or sets of traits and here is one potential taxonomy: symmetry, averageness, dimorphism, youthfulness and cuteness. It is vital to understand that I refer only to these traits when I use the term "beauty" here. In addition, I also use the term to refer to both sexes, men and women alike. First, I would describe symmetry as a "pleasurable proportional balance". The assumption is that symmetrical form is a positive health indicator or a sign of "genotypic and phenotypic quality", because it is hard to maintain for the reason that "environmental stress often causes disturbances to development and optimal symmetry may be unattainable" (Sugiyama 311-12). In another words, since symmetry is hard to sustain, a person possessing a highly symmetrical body and face must have an exceptional health to resist the environmental wear.

Second, averageness seems to be a property that most people inherently assess as a "standard" of good looks, as if we would have an innate mental image or "schema" of attractiveness. What this means is that, in general, we prefer resemblance over difference in our looks. As it happens, averageness may easily be realized with computer imagery and superimposing technique (or blending several pictures together). Surprisingly, it has been found that a "virtual" face made using this technique is always more attractive than the original faces. In fact, it was found in one German study that the "virtual" Miss Germany, which was computed by blending together all other contestants of the beauty contest, was assessed far more attractive than the "real" (or selected) Miss Germany in 2002 (see www.beautycheck.de).

Third, dimorphism (or dual formism), denotes to a set of sexual traits that are evolved to attract the opposite sex and that may be assets in partner selection or intra- and intersexual competition. Dimorphism manifest in varying set of features such as facial differences, height, mass and proportions that are assumed to develop partially under the influence of male and female hormones. What is necessary to know is that sex hormones are dangerous in large quantities; it is hypothesized therefore that the bearer of strong dimorphic cues needs to be extra-resistant against the health risks. Anyhow, differences in size and strength, for example, are primarily thought to be the result of higher intrasexual competition in one sex than in the other, where as ornamentation (e.g. facial features) evolves because of intersexual selection. (Sugiyama 2005, 314.)

Finally, youth and cuteness are both characteristics of young people and youthfulness is among the most powerful signals. As Nancy Etcoff (1999, 9) states: "There is tremendous power in a young woman's beauty." In any case, it is easy to associate the characteristics of youth to health, for it is obvious that young people, on average, are healthier than old. I will next take a little closer look at the set of cute cues, since they appear especially interesting to me as a designer. Actually, cuteness denotes to the traits of human infants and they are not restricted only to appearance, but cover infant behaviour and utter sounds as well. Allegedly, the over-spilling nature of the cute preference may derive from our highly affective nurturing responses.

Now, the assortment of cute features and behaviour include bright round forward-facing eyes, set low on the forehead, a proportionally big round face, a pair of big round ears, floppy limbs and a wobbling gait. These cues point to an extremely young age, helplessness, harmlessness and need. Natalie Angier (2006) notes that cute features can be found in the appearance of inanimate things (such as the round-formed Volkswagen Beetle), animals such as the panda (belonging to the fearsome clan of bears, an unlikely target for our cute preference) or even names like Google (sounding like baby babble). Even though these examples are so apart, we still seem to find cute cues in them. It appears that our taste for cute is highly sensitive and even a slightest sign activates it.

I will end the treatment of this topic by taking up one necessary issue which I have not touched yet: namely, the concept of ugliness. This is important considering the appliance, because it would be impossible to create even a simplest signal system without some contrast. As it happens, my preliminary investigation suggests that there might be no empirical studies on ugliness and even freethinkers have been keeping a low profile. I have therefore decided to construct the traits of ugliness myself by contrasting them with beauty. For instance, the obvious opposite of symmetry would be asymmetry and the traits of old age will contrast the traits of youth. But now is the time to sketch the learning application.

HUMANIZING MACHINE INSTRUCTION

To start with, this is a multidisciplinary research and design project, attempting first to carry on the tradition of machine or computer assisted instruction (CAI). Second, it extends the tradition of nonverbal communication studies in psychology, which usually deal with body and face movement (expressions) only, by including appearance as well. More precisely, those traits of beauty that are assumed to be universal or pan-human are in question here. Third, this study will take the art and craft of artificial character design from its traditional domain of entertainment to the province of education. Effectively, my project is about beauty, character design and the application of both in education.

Let me first introduce briefly the art and craft that I call "humanizing". Effectively, it is a way of putting human features into artificial use or, in other words, a technique of designing attractive characters utilizing human traits. Most importantly, the aim of humanizing is to make inhuman characters humanly engaging (appealing and interesting) and identifiable (emotionally understandable or empathetic). This goal may be accomplished by mimicking human traits: that is, imitating human appearance or aping human behaviour (or businesses). Traditionally, artificial humanized characters have mainly been utilized in media entertainment, e.g. cartoons, animated films, movies and digital games. Within these industries, the principles of humanizing are well established and widely in use (e.g. Thomas and Johnston 1995; Keinänen 2003). It is therefore a bit surprising that serious applications are in short supply.

There are numerous reasons for the long tradition of attempts to put machines into work in the field of education even though they are not alive and do not possess many of our abilities, attributes or strengths either. For instance, no machine possesses any cognitive or affective abilities. But it follows also that they do not possess some of our weaknesses either that come with those abilities. For example, here are some of the strengths of machines: firstly, machines are tireless and they are always available; secondly, since machines do not possess cognitive or affective abilities, they carry out dull tasks well and do not get frustrated at slow learners; thirdly, machine performance is exactly the same every time when performing the same task; fourthly, machines treat all learners equally since they cannot have favourites among them (only the programmer can). To be sure, a machine cannot replace any teacher since it may only act upon its program, but it is important to understand that it may still assist—even autonomously to a certain limit. But finally, it is time to sketch the actual appliance.

My plan is to build an interactive application, meaning here that the character may respond to the user input instantly, thus allowing direct guidance if necessary. As noted, the character will give the instruction non-verbally, using the traits of beauty and ugliness. This is possible with a simple but effective technique called morphing, or shape-shifting. The idea is that the character turns uglier when the user is going to an undesirable direction and vice versa. In essence, this is what the whole project is about: namely, to test whether this model of instruction works since nobody seems to have tested it

before.

Naturally, there must also be a learning task or problem to solve and it has to meet a few conditions. At least, the task must have a process nature so that there is room for guidance. In addition, there must be a relatively clear and correct way to accomplish the task, as opposed to an incorrect one; otherwise, the solution would be difficult to program. Moreover, the performance must take some time so that the time of performance may be measured. This is because I need to compare the performance of a test group and a control group to provide some scientific data. Unfortunately, I cannot give out any production ideas at the present but only describe the appliance broadly, because the instruction model is not yet constructed.

In any case, what one would see on a screen is a humanized character in front and a task in the background, for example. In effect, the situation will be similar to that of being before a private teacher, except that the instructor is an automated representation of a person here. In the long run, the idea is that the character could eventually perform in a variety of learning tasks—this only being an opening prototype production. What this means is that additional tasks may be constructed and the character copied and integrated into these new tasks. This is to say that I am trying to create a task independent (or general) model of instruction here.

Before closing my case, one obvious question remains: "What might be the uses of this kind of an application?" Well, I imagine that in a classroom situation the teacher could give a machine-tutored task to the class, while allowing some time with a pupil who requires personal instruction. In addition, some special groups of learners might benefit: for instance, those who have problems with language usage, whether reading or understanding speech. But I assume that the most prominent uses may reside in future electronic learning, because my instructor may easily be distributed through Internet and the instruction is based on universal signals. This would make automatic worldwide instruction possible, because language problems and country borders would matter no more. But all this remains to be seen, since the application must generally work first—which is my main concern in this project. Finally, I thank the reader for endurance and remind that all of this was based on preliminary study and plans.

SUMMARY

My argument was that it is possible to develop a digital tutor that instructs with the help of universal signals of body and face beauty. To check this hypothesis, I plan to build a computer-based application introducing a humanized digital character and a learning task. Additionally, I will put it into an empirical test. I have also made an attempt to show that beauty is important and useful and described the morphology of beauty as well. Finally, I have broadly rendered the instructional application. Now, what remains to be seen is whether it works or not.

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MedienBildungsRaum: Media - Art - Space

Torsten Meyer, Timo Meisel, Konstanze Schütze

ABSTRACT

Our laboratory at University of Cologne has grown from a regular classroom to a multi purpose learning space - MedienBildungsRaum (mbr). Dealing with concepts of multi-purpose learning environments and theories on learning spaces and knowledge building, we consider physical and virtual space equally important for present and future learning processes. We seek to prepare flexible core concepts for adjustable spaces of a new learning culture. Hence we develop patterns for different settings of learning and knowledge building activities based on Christopher Alexander's Pattern–Language (1977) finding solutions for their representation in our particular medienbildungsraum. In our understanding it is vital for knowledge building to allow technology and architecture to be unnoticed and extraordinarily flexible to the changing demands of learning at the same time. Adjustable, agile, corrigible installations, furniture and portable technology define distinct but temporary zones of action and enable diversifiable settings for learning.

Keywords: Education Design, Pattern Language, Medien, Bildung, Raum

MEDIA, SPACE, LEARNING AND PEDAGOGICAL DATATECTURE

Education Design creates *Settings* that structure *pedagogical environments*. In the following working hypothesis, we would like to describe *pedagogical environments* by referring to the interaction of two integral learning dispositif - media and space. We have chosen narrow, radically simplified space and media definitions in order to develop a third term that depicts an innovative movement towards convergence: the term *Datatecture*.

When focusing on the area where *space* and *learning* overlap, then *Learning Spaces* manifest themselves in architecture, educational institutions as well as conglomerations of tools and materials. In analyzing the overlap of *media* and *learning,* our attention is drawn towards media that directly influences and supports said learning, or *Learning-*

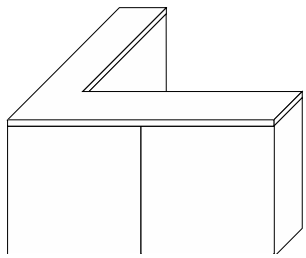
Supportive Media. Examples of *Learning-Supportive Media* can take the forms of workbooks and tests, knowledge archives manifested in files and data storage devices, various types of presentation technology - from using a whiteboard to educational films - and not ending with research opportunities in libraries and world wide digital networks. Through utilizing these classic tools of design we then have access to *Learning Spaces* and *Learning-Supportive media*. A proven repertoire made up of architecture, product design, visual communication and media/information design may be employed, in order to increase the quality of learning.

Something completely unique occurs in the area where media and space intersect. In the course of the digital revolution, we have been increasingly confronted with structures where it is no longer certain if they should be defined as space/things or as media. Concrete examples of this 'mutation' are the multitude of channels, devices, tools, interfaces and media ensembles/groupings that permeate our everyday lives. We use these mediums to organize communication, receive feedback, bridge distances, advance our cognitive abilities, convene at "third places" (Oldenburg) and construct alternative worlds. In these *Datatectures* - described in a singular form in the PI's preliminary work as a "new medium" in the context of a transformed environment - space and media converge and, in the case of pedagogical use, become *Learning Spaces* and *Learning-Supportive Media*. In other words, *Pedagogical Datatecture* can be used as a creative starting point in integrating l*earning spaces* and L*earning-Supportive Media*. Therefore, a special amount of attention is devoted to *Pedagogical Datatecture* in Education Design. When considering the perspective of educational studies, we are entering virgin grounds with immense potential for development, and yet subject areas such as *communities in massively collaborative environments, educational gaming, ubiquitous open distance learning,* tools with *tangible user interfaces* and *augmented reality learning* hold great promise in re-defining the process that is learning.

CREATING PEDAGOGICAL ENVIRONMENTS: PATTERNS AND PATTERN LANGUAGE

Those settings which we strive to create, and out of which pedagogical environments are composed, may be interpreted as *patterns* as defined by Christopher Alexander's Pattern Theory. Patterns possess and entrap elements of our environment. The interactions of said elements generate the pattern's entity, which carries a higher value than simply the sum of its parts. (e.g. tables, chairs, whiteboards, students and teachers meld into the familiar pattern "classroom"). A pattern is a definable and perceivable arrangement of elements, and yet it is also permeable and able to create wide-reaching connections. Patterns link with other patterns, which are located on an either higher or lower level of abstraction and complexity, and create so-called *partial formations*, as the individual patterns share common elements. Through this process patterns establish a rich topology made up of overlapping, inclusions and exclusions, which then variably structure our environment.

In a *pattern language,* patterns are organized into a hierarchy according to their degree of abstraction and complexity. Furthermore, every pattern invariably refers to "larger" patterns, therein contributing to the completion of these, while also being composed of "smaller patterns" which are then necessary to function individually. Due to the pattern language's flexible structure, our Education Design Language can be used to create extremely individual pattern languages that address the particular pedagogical environment on location - taking into consideration the parameters of site, time frame, staffing, budget, etc.



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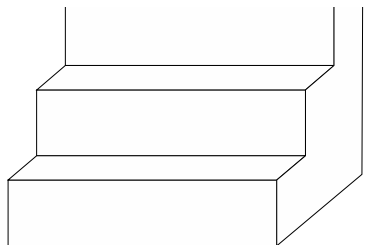

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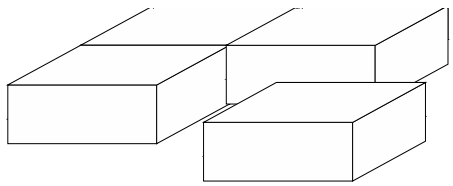

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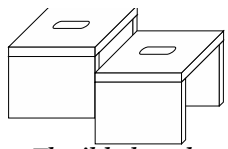

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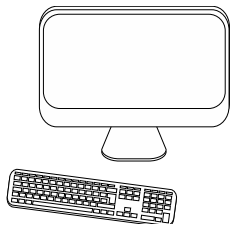

Technology

A MEDIOLOGICALLY CONCEIVED THEORY OF LEARNING

By modifying pedagogical environments, Education Design aspires to improve the teaching and learning processes, and thereby must have terms at its disposal that appropriately define learning and its targeted subjects, or rather, must be able to develop these terms within a project-specific understanding. Therefore, fundamental research in educational theory must be carried out, as the disregard of the influence of the pedagogical environment is strongly connected to the transferred description of the subject being educated, in which learning is primarily understood as an individual cognitive effort. This viewpoint is rooted in a concept of education dating back to the 18th/19th century, which perceives learning as a largely linguistic and communicative phenomenon, focused solely on the subject as an individual (and the individual as a subject).

Anthropology of media culture and techné knows about the coevolution of physical, symbolic and social tools with which humans (and their descendants) surround themselves and by which they are surrounded (those of their ancestors). Thus, letterpress printing changed the environment of human cultural communication and laid the groundwork for a new techno- and sociosphere, deemed the *graphosphere* by Régis Debray, in which the modern European collective intelligence easily evolved.

Currently, we are experiencing a boom in the global distribution of network technology, but also a noticeable increase in the potential, efficiency and importance of symbolic collective intelligence (Pierre Levy). The individual intelligence, the ideas of the "genius" and the "lonesome hero" that seemingly influenced the graphosphere, are now outdated and are superimposed by new concepts. Our contemporary education system seems left far behind by these new qualities. Both schools and universities appear stuck in that former world that they helped to re-create. The once efficient coevolution processes of education and its dispositif are clearly no longer in balance with one another.

Thus, a pressing need for further research results and a concrete idea evolves: can educational theory be consistently perceived within the Actor-Network-Theory as defined by Bruno Latour and Michel Callon? Furthermore, can learning be understood as the transformation of the learner's relationships to his/herself and to the world (Rainer Kokemohr) - while remaining within the full consciousness of materialized, virtualized and institutionalized culture - a process that could also be regarded as a non-human

actor, and not simply a secondary parameter? Such a deviation from traditional theories would radically alter our understanding of "subjectivity".

MEDIENBILDUNGSRAUM AT UNIVERSITY OF COLOGNE

We acquired an approx. 90m² room, which has been successfully transformed into a *multi-purpose learning-space (Medienbildungsraum .mbr)*. The *.mbr* combines a traditional seminar room with a presentation and performance space, a workshop for digital design, a semi-professional post-production studio and a wireless mobile classroom with 30 workstations. All of the faculty's events will be held within this space. Therefore, the *.mbr* truly is the first real-life experiment with pedagogical environments fully influenced by the digital age.

While working on the *.mbr,* we identified the pattern language according to Christopher Alexander to be a methodological instrument. During the course student-teaching seminar, the process of designing a space with patterns was conveyed to the students and a student group was selected to cooperate on the further development of the pattern language. We have then already initiated the desired participatory process supported by a methodological foundation.

Theoretical confrontation with the transformation of the subject of learning - occurring as a result of a shift in the media landscape - was not only the content of the seminar, it also determined how projects were executed. Through collaborative structures, flanked by the intensive use of digital infrastructures for production and research, the students' senses of reflection and know-how could stimulate one another. The dedicated work, repeated participation and increase in seminar participants shows just how successful this concept is.

With the *.mbr monthly* we created a platform, with which to establish impulse talks and workshops from disciplines such as art, pedagogy, media studies, philosophy and design. The contributions from neighboring disciplines should not only widen the participating students' horizons, but will also lay out a contact network of guest lecturers and consultants who move freely within the framework of Education Design.

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Located Lexicon: a project that explores how user generated content describes place

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ABSTRACT

Building on our previous research and practice in geo-locative projects (1) we are making a set of tools that extracts existing and emerging channels of geo-located personal data to create user-generated descriptions about place. The Located Lexicon project develops understanding about if, how and why geo-location is used to generate crowd-sourced descriptions of the places we inhabit. Since the mass take up of smart geo-locative devices we see a new geo-presence of community emerging and we want to devise tools that enable learners to both produce and analyse this user derived data. The idea for this project grew from envisioning an augmented view, like that from the top of a tall building, in which the describing words found in tags and tweets posted in that location could be plotted onto a visual map of that area. This would enable large scale overviews of an urban environment to be annotated with personal, everyday, 'off the cuff' data.

To this end, our project involves making two applications that enables the urban environment to be described vividly and personally by its inhabitants at a more granular, local level. The first uses infrastructural terms from the built environment to search-and-visualise large scale user generated content (UGC) and the second asks individual users to place a value on, and describe their location in response to a broadcasted query. We wanted to find out what words emerged as being common or shared in describing place from UGC and how a lexicon of terms could enable the formation of Twitter-like groups that allow users to engage in finding out more about their location, especially by spotting what is not there in the datasphere. Our focus is on building and using applications that 'update and respond in real-time' (2) to UGC to learn more about the spatial, temporal and subjective nature of place. For this project, we understand 'place' as a 'constellation of processes rather than a thing' (3) and so our focus is on the objects, qualities and activities that continually mix and carry on in a geographically defined location that contribute to user-generated descriptions of place.

This paper presents the details of our experiments conducted so far and the outcomes produced. We start by describing the context to outline our thinking behind, and motivation for, the project. This is followed by a series of initial experiments we have undertaken that have informed a working concept for the Located Lexicon application. We conclude the paper by drawing together the main findings and reflections from the project.

Keywords: lexicon, place, geo-location, Twitter, Flickr, crowds, user generated content.

CONTEXT

Our previous practice-led research has involved designing methods and applications that encourage learners to make responses to content delivered to them in live locations that helps develop knowledge and understanding about the built environment. In this, we have often used the phrase "it's like telling bits of the story that allow others to connect the fragments to make their own stories in and about that location." We have worked with young learners in schools to produce 'partial stories' as initial or seeded content for nodes on a walk or tour of a location, content that grows and evolves as other participants in the event add their own data. This time, we wanted to explore how unspecified UGC posted in location could be 'sucked up' by an application and plotted to produce nodes that could be mapped in interesting ways to invite further investigation.

LEARNING: CROWDS, GEO-LOCATIVE DATA AND MOBILISED LEARNERS

Mobile technologies can be utilised to provide opportunities for learning in which the physical mobility of the participant and the location are, simultaneously, *mobilising* elements in taking action to change or transform something. (4) In this paradigm, qualities of urban topology can be understood in terms of the situatedness of people in which the physical environment, the time and their actions are complex and 'of the moment', resisting a singular description. Geographer Doreen Massey echoes these complexities in her definition of happenstance as the 'positionings-in-relation-to-each-other'. (5) Educationalist Jan Nespor uses the term 'spacetime' (after Massey) in highlighting a need to consider pedagogies that are concerned with bodies, space and movement: 'To make something meaningful is to situate it in spacetime, or better, to put in motion along certain paths that trace out particular networks of association.' (6) What is interesting here is to consider how UGC can be collected to produce 'networks of association' that reflect these chance happenings associated with experiencing place.

If we start to think about the volume of a mass of participants, this adds an interesting dimension to what we mean by mobilisation in learning. In 2004, learning technologist Bryan Alexander specifically reported on the 'emergence of *learning swarms*' and identified how individuals (students) acting independently in a university campus could gather together to learn collaboratively using mobile and wireless computing practices. (7) The independent actions of individuals are also an important feature of James Suroweicki's *Wisdom of Crowds*. (8) In this book, he argues that crowds, by making individual decisions, can together generate expertise and generally come up with the 'right answer'. Of particular relevance to us is his account of coordination experiments by social scientist Thomas C. Schelling in 1958. Schelling conducted a series of experiments that involved a group of participants identifying a common focal point or landmark without communicating with each other. For example, when a group of students were asked to meet

someone in New York they individually cited Grand Central Station as the location they would go to. When probed further as to the time of the meeting, the majority of students said 'noon'. From this and other examples of 'Schelling points', Suroweicki surmises that culturally 'people's experiences of the world are surprisingly similar' and that this makes decentralised coordination possible. (9)

If we combine individuality and interactivity of learners with smart phone technology and geo-location we can start to imagine how a distributed and decentralised crowd and/or group might contribute to describing place. Sharing information using smart mobile, geo-locative devices is a common feature of the second generation of the Internet, Web 2.0, and provides a readymade mass of UGC. Research into crowd-sourced sensing, however, has argued that that the ubiquitous vision for mobile technologies falls short in that there is a lack of infrastructure for smart phones to be used for collaboration and co-ordination (10). This research goes on to describe how the 'open publish-subscribe system of Twitter' can be harnessed to engage users in 'crowd-sourced sensing and collaborative applications' (11) where they effectively become harvesters of environmental information (such as weather conditions and noise levels). So we needed to find out if services that support UGC could be utilised to provide us with a mass of geo-located users who could send us information about their location from which we could build a richer description of place.

SERVICES: PUBLICLY AUTHORED GEO-LOCATIVE DATA

We have analysed data from geo-located posts on the popular services Twitter and Flickr to see if users use geo-location, and if they do, how their posts are affected by being location-aware. Our first step was to find the proportion of users who have geo-location services switched on. The Twitter service initiated in 2006 has a huge user base and can be summarised as a simple text broadcasting service where users can broadcast or post 'tweets' of up to 140 characters that other users can follow and/or respond to. Geo-location services for Twitter were turned on in 2009 and research has shown that users have been slow to 'switch on' geo-location and if it is on, to use it effectively. This is clearly illustrated in one study that showed as little as 0.42% of tweets have latitude and longitude readings in their locative metadata. (12) Our brief analysis broadly backs up this trend. We studied all tweets posted by users within 1km of the location of Canary Wharf and also within 100m of Nelson's Column, Trafalgar Square in London over one week and analysed the location data of the tweets to see whether geo-location was switched on (illustrated by the longitude and latitude fields of metadata) and what proportion of these users showed changes in their geo-location from one tweet to another indicating they were physically on the move.

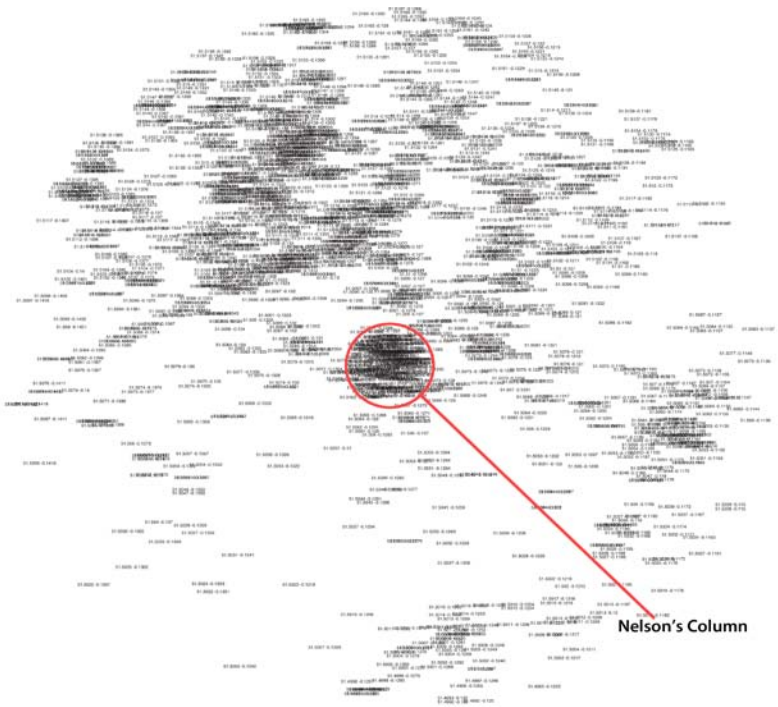

Figure 1: Visualisation of Tweets Posted With 100m of Nelson's Column, July 2011.

The vast majority of Twitter users captured in the sample at both Canary Wharf and Trafalgar Square did not have geo-location switched on (they had no longitude or latitude in their metadata) and the location data that positioned them was based upon their own user input – ie their postcode or address. This location data is inputted by the user when they join the Twitter service, but it is not mandatory and it may not actually be accurate to the location of the user. For example, a user may enter their location as 'Canary Wharf' but they may be physically tweeting from another location. Also it has been shown that because of the relatively cumbersome nature of manually changing user location (13) it is unlikely that a user will change their location from the initial location they entered when joining the service. This issue is further exacerbated by users who initially tweeted from a static desktop, but then started tweeting from their smart mobile device, but have not changed their location or even seen their location as important.

Research asserts that 46% of Twitter users use their mobile devices to tweet from, a higher proportion than any other UGC (14), so it is likely that half of them are on the move but from our sample it is clear that location services are not being actively utilised or that their device may not have that functionality. In the sample from Canary Wharf, of users that did have geo-location switched on we found that only a small proportion of them changed position over time. This indicates that they were either never on the move, had only used a geo-location service to initially position themselves when joining or had geo-location services enabled on their mobile device only intermittently and the last location

sticking as their location.

Recent research has shown that smart phone owners are aware of location based services but do not use them – and that the biggest reason cited is privacy concerns. (15) Shared anxiety about leaving a 'breadcrumb trail' of data that can give away a user's identity and may impose on their privacy has given rise to concerns about how this data might be stored and used by others. This is illustrated by public distrust of the Apple iPhone 4 data capture function that stored location data on a file on the phone itself. Questions about why this data was stored and what is might be used for (16) caused Apple to bring out an update removing the geo-location cache from phones. Distrust of location based services and data used in combination with UGC to identify users and their movements, is cleverly illustrated by www.pleaserobme.com - an internet service that can use UGC data to determine whether a user is away from their home so that their house can be burgled. (17) The website was initiated in order to show the risk and genuine concerns of UGC (especially when connected to geo-locative data) to personal privacy and security and how this can pose risks to individuals perhaps never seen before through the Internet. And when a user does not see that geo-locative data is central to the use of the service this, combined with the privacy issue, is likely to result in a low take up.

It seems certain that fears for privacy have had a large effect on the take up of geo-locative services in Twitter and as these are developed, so may reliance on a 'critical mass' of users to take part so that the service can truly function. From our sample data we would assess that any service that relies on accurate geo-location data attached to any tweet would not function successfully at present, mainly because of the small proportion of users actively using geo-location but also because of the 'noise' coming from incomplete or wrong data. (18) The implications of this means that it might not be effective at this time to utilise existing UGC from Twitter for geo-locative crowd source sensing and collaboration. With our discovery that 'geo-location is not working at present for Twitter' our next step was twofold. Firstly we wanted to analyse the actual words in tweets to discover information about location and place. Secondly we want to see if there was any way to reconfigure how a user uses the Twitter service so that we could leverage its powerful functionality but allow them the potential to integrate with the service in a new way where the only form of identity was the geo-location of the tweet, not the user's actual identity.

Our initial research into Flickr and geo-location was more cursory than our research into Twitter. Our main area of interest with Flickr and geo-location was assessing whether an image that had a valid geo-location was actually taken at that location. Flickr has fully incorporated geo-location metadata of images and conceptually in our view the reason for this is more obvious – a photo often refers to a location. Users can generally understand 'why' geo-location of images is a useful thing to do and as such there are many functioning services where geo-location of photos is used in the production of images and in the categorisation and display of images. Our real interest was the user generated metadata surrounding the image - namely the title, the content and the tags –

we wanted to see whether this data held any value in relation to describing the location in which the photo was taken. (Indeed analysis of metadata from images has been used widely in other studies as cameras can record a myriad of data when taking images, including environmental data.) The Flickr API offers rich tools to extract and explore this metadata and Flickr users are often meticulous in tagging their images with words that describe the image and this is of more interest to us than the photo itself. In order to do this we set up Experiment 1 – an app that sucks up UGC, which we would then manually filter and analyse.

EXPERIMENTS

Experiment 1: Manual Filter

In this first experiment we used the Twitter and Flickr API to get geo-located posts that came from various locations within London. We chose Hyde Park as one location on a hot weekend in early August 2011. In our sample we only included posts that had complete geo-located data, we then searched through these to see if we could identify whether the posts actually referenced their location. Analysis of this sample produced five broad categories of posts:

1	Advertising tweets relating to activities/events located in the area	*Example* Wed Aug 03 12:16:43 BST 2011: RT @bbcproms: Enjoy the Horrible Histories prom? Here are The Four Georges performing Born 2 Rule! http://t.co/1ud3v95 #bbcproms (WD)
2	Advertising tweets relating to activities in Hyde Park	*Example* Wed Aug 03 11:26:10 BST 2011: RT @SerpentineUK: The Serpentine Gallery Pavilion is on this week's Gardener's World. It's always nice to reach out to new audiences... http://t.co/9lmis9A
3	Indirect reference to Hyde Park	*Example* Wed Aug 03 12:12:42 BST 2011: Sunglasses ruin the eyecontact battle.

4	Direct reference to Hyde Park	*Example* Tue Aug 02 21:57:47 BST 2011: Watching elderly proms goers trying to break out of Kensington gardens, and watching tourists trying to break in
5	Direct reference to the wider area	*Example* Wed Aug 03 11:23:31 BST 2011: Why does all traffic for central London go through fucking Knightsbridge with one lane of traffic!! Sort it out Boris

Figure 2: Five Categories of Location- Referenced Tweets, Hyde Park, London, 2-3 August 2011.

Our sample showed that within the chosen location that tweets outnumbered Flickr posts by about 8 to 1. Although our manual check showed that most tweets did not refer to their location, this changed quite dramatically when Twitter users attached URLs to images that they uploaded along with their tweets – especially in categories 3, 4 and 5. Applications such as Instagram allow the user to apply filters to photos taken using an iPhone and, along with other services like Foursquare and yfrog, to instantaneously share them via Twitter and other social networking sites. We found that when tweets were embedded with these links the combination of text and image would often make direct or indirect reference to the location of posting.

Category 3 Tweet: Tue Aug 02 19:49:58 BST 2011: Yum EEEE http://t.co/GbknNQI (shared via yfrog)	

Category 4 Tweet: Tue Aug 02 15:15:13 BST 2011: Sitting in the summer pavilion in Kensington Gardens. http://yfrog.com/h4ssclyj (shared via yfrog)	
Category 5 Tweet: Tue Aug 02 18:39:09 BST 2011: This is what happens when the chicken doesn't wait before crossing the road. @ Knightsbridge http://instagr.am/p/JKwld/ (shared via Instagram)	

Figure 3: Examples of Category 3, 4 and 5 Tweets with Embedded Links to Images.

We found that the vast proportion of geo-located Flickr images that we gathered at Hyde Park were taken and posted there. Similarly, a significant proportion of images were uploaded via third party applications on smart phones. We hoped that the user generated data (tags, titles and content data) - usually very rich in Flickr - would give us valuable contextual information describing the location in which the photo was taken. In a reasonable proportion of photos we did find this, the data was generally about the location and the activity happening there. Perhaps because of the instantaneous nature of the photo uploading, however, we found that there was little textual attributes to some of the photos, users often not tagging the images with information such as title or tags or content data. The textual metadata that we did find was rich and of interest and generally quite specific to the location and 'moment' the photo was taken, one such example being photos taken by a multitude of Flickr users from The Royal Albert Hall at the 'Proms' music event. (Figure 4: Sample of Images Uploaded to Flickr Relating to the Royal Albert Hall, near Hyde Park, 2-3 August 2011.4) We found users took photos from inside the venue and added some comments that described the environment. We also

found tweeters at the same time and location commenting in similar ways about the 'hot temperature' within the Hall.

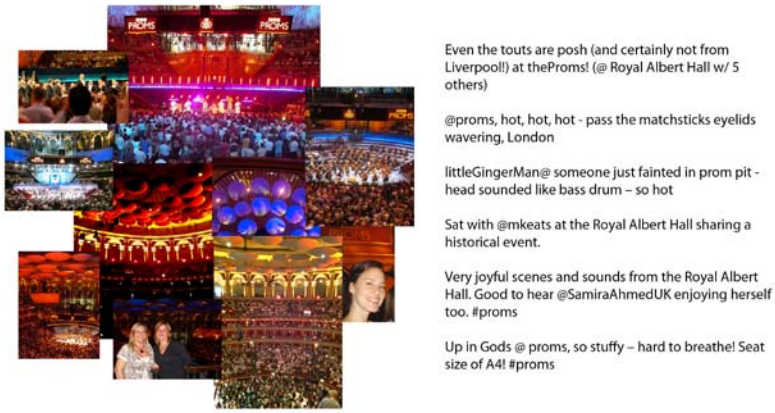

Figure 4: Sample of Images Uploaded to Flickr Relating to the Royal Albert Hall, near Hyde Park, 2-3 August 2011.

We made several findings from this first experiment that identified areas for further investigation. Firstly metadata from images tended to describe the location and time in which an image was taken. Secondly, that that tweets embedded with URL links to photos were more likely to describe the location they were in and the activity happening there. Negatively we found tweets were more likely to bear no relation to the location than to it and that often instantaneous photo uploads to Flickr would not have supporting metadata describing the location.

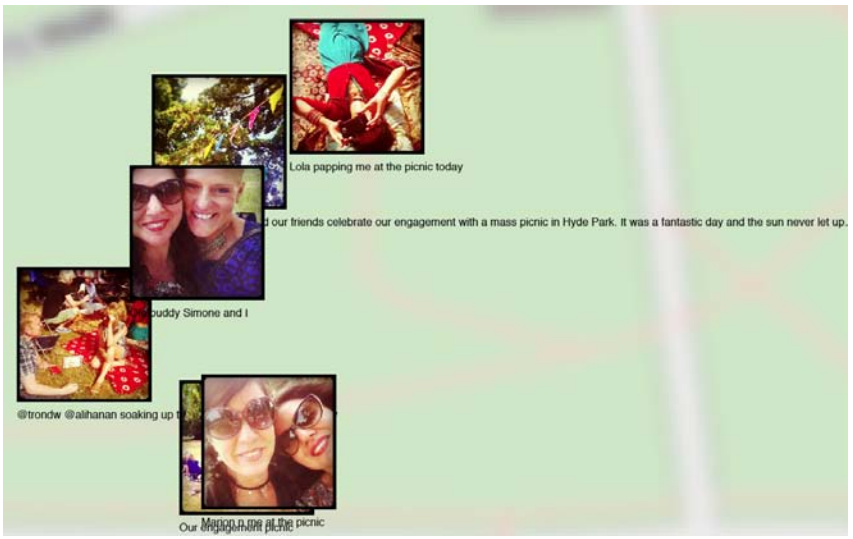

Figure 5: Visualisation of Photo-Embedded Tweets Posted at Hyde Park, 2-3 August, 2011.

We discovered that when users took photos of a location they were much more likely

to make reference to the location either by naming it or indicating the activity taking place there. We also found paradoxically that Twitter users who attached images to tweets were more likely to describe the location than Flickr users sharing photos via Instagram or other instantaneous 'share' apps. A possible reason for this is that tweeters keenly understand that the central emphasis of a tweet is it's text, words are absolutely key to a tweet so they place emphasis on text - and because it is a tweet about an image, the text tends to be about the situation in which the photo was taken. The Flickr user is more likely to see the textual metadata as supportive rather than the fundamental mode of communication. From this we suggest that the service goes some way in prescribing user activity.

Figure 6: Tweets Plotted on to Map of Hyde Park.

Experiment 2: Search Terms

We created a small app to search for tweets that had a location name, for example 'London', within the tweet. Research has been done to identify the location of a tweet from the body of the text with reasonably good results even without any other geospatial data. (19) We already knew that the vast majority of tweets do not have any relevant geo-location metadata so we wanted to see if we could find locations through using place name searches of the actual tweet text. We wanted our app to not only search for a place name but to link this with further sub categories that would help to refine location of the tweet.

A hierarchy of terms for spatially visualising volunteered geographic information provided a useful starting point for building an initial framework of terms that describe the built environment. Edwardes and Purves (20) and then Dykes et al (21) have developed a hierarchy or 'treemap of terms' in which node size visually represents the number of times a term occurs in metadata associated with 'geographs' (photographs with metadata posted on the *Geograph British Isles* website). The hierarchy is based on selecting 'basic levels' or 'scene types' and then identifying the most popular descriptive terms associated with these (scene type descriptors). The scene type descriptors are then categorised into qualities, elements and activities for each scene type.

BASIC LEVEL **SCENE TYPE**

30 POPULAR **SCENE TYPE DESCRIPTORS** (STDs)

10 **QUALITIES** (ADJECTIVES) 10 **ELEMENTS** (OBJECTS FOUND IN THE SCENE) 10 **ACTIVITIES**

Figure 7: Hierarchy for a 'Treemap of Terms', taken from Dykes et al, 2008.

This model identified a way of thinking about how 'scene types' in the built environment might be drawn from searching metadata by the multitude of everyday users on Twitter or Flickr. We defined three kinds of search for the purpose of this experiment, all based on using nouns that name physical and organisational facilities and structures in the urban environment:

1. NAME OF ACTUAL LOCATION + NAME OF INFRASTRUCTURAL STRUCTURE eg London + pavement, London + bus stop
2. NAME OF GENERIC INFRASTRUCTURAL FACILITY + NAME OF INFRASTRUCTURAL STRUCTURE LINKED TO IT eg park + pavilion, street + café
3. NAME OF GENERIC INFRASTRUCTURAL FACILITY ONLY eg. footpath

The infrastructure terms seemed to provide tweeters with locating words for expressing relations between themselves and their physical location as initial searches on Twitter showed (below). The terms operate as a set of universal cues that provide a simple search-and-visualise method of UGC that elicits data on how users describe a sense of place.

Category 1 search: 'London' + 'bus stop'

Iv never seen **London** full up ah so much police. Iv been waiting at my **bus stop** for 5min and bout 10 police cars have drown by.#miles

Ah, memories of being at **London**'s Hyde Park. Thanks for the pic. RT @Kwame Oh: I'm at Hyde Park Corner **Bus Stop** [pic]:http://t.co/ogyw9kX

Me personally if that was **London** I wouldn't even take **bus** to west I will RUN there selfridges will be my 1st **stop** off!

A drunk man at the **bus stop** just gave me a can of Red Stripe. Who said **London** can be unfriendly?

RT @RaveenaTheBoxer Sunny with a breeze, nice day touring on the **bus** in **London**. Next **stop**: SW1. Slightly tempted to rent a bike or jo...

Category 2 search: 'park' + 'path'

Fallen cicadas strewn/ The **path** winding through the **park**/ Summer is over #poetry #haiku

Loved seeing the the directions to Stanley **park** on a bike **path** around Broadway and naniamo. #lolwhat

Crab **Park** well off the city's beaten **path** straight.com/article/crab-p… via @georgiastraight

I got to run on the **path** alongside the 2-spot mini steam train in the **park** today and it was awesome.

More bike time!! :) (@ Randolph **Park** Running **Path**) http://4sq.com/nShyzw

Category 3 search: 'footpath'

Beddington Farm 3.WOOD SANDS on South Lake still early morning viewable from **footpath** running north from Beddington Park

I just saw a guy walking a lawn mower on the **footpath** #Maroubra

it's stopped raining long enough for there to be light grey patches on the **footpath**.

unfortunately the killer seagulls have returned

Our experiment was successful in identifying tweets with a place name. For example, in the 'London + 'bus stop' search we would find tweets that were invariably about or seemingly from that place. We also found that more localised place names returned valid results for example 'Clapham' (a borough of London) returned useful data. We found that tweeters were happy to say where they were in the body of a tweet more so than having location services switched on in their setting. In one example we searched for 'place name' and the term 'traffic' and we found results for every borough of London which led us to the conclusion that we could derive data about London traffic and localise it to down to boroughs through Twitter content on its own. The only thing to consider is that a tweeter might be tweeting about a place not from the place, but even so the location is a significant factor.

At this point it is important to point out some of the limitations of searching Twitter namely the fact that searches can only go back 'so far'. There is no hard and fast rule about how far back in time any Twitter search can go (22) but it seems that the length of time a search can go back depends on two things: firstly, any search cannot return more than 1500 results, so if your search is a popular term the results will go back in time only until the first of those 1500 tweets was posted. It also seems that no search, even a search for a rare term, will go back more than a certain amount of time depending on the capacity of the Twitters servers. (23) So if there is a lot of traffic or posts then the distance back in time for any search will be less and this has been described as a yo-yo effect (24) - as the tweet volume increases the distance time searching back decreases, but as capacity of the Twitter servers increase so the distance back in time of a search also increases. From this it is reasonable to assume that a search will not ever go 'right back' in time to a particular date that is of interest, making trend analysis over time subject to constraints with Twitter in its current guise. So for example it would be impossible to make an app

that could look back over a longer period of time at the tweets about road traffic in a location. So Twitter is good for searching the recent or the here and now.

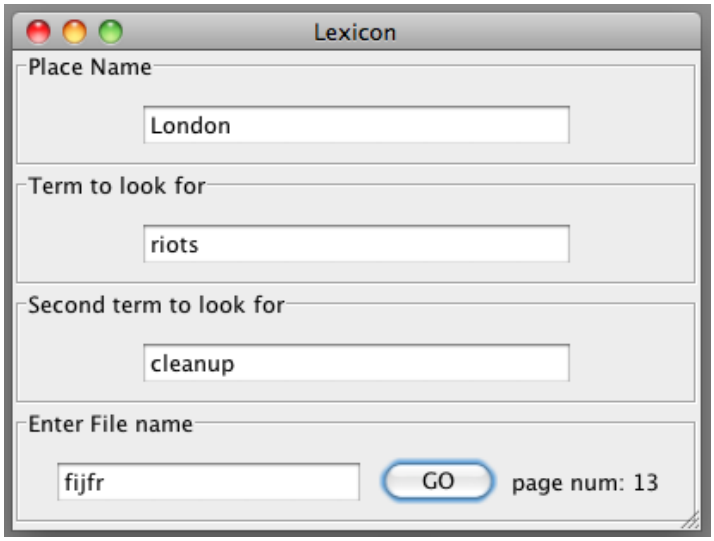

Figure 8: Experiment 2 App Search Terms.

Experiment 3: Crowd Sensor App

Our emphasis for the design of the Crowd Sensor app was to make an application that would allow the user to contribute comments on their current location with the data being transferred to Twitter via a hidden user logon. With the user in control of inputting their details they would effectively be anonymous. Our approach was to try and create a user experience that was simple and quick to use with an emphasis on the user not being identifiable. Another important element was that the user should be able to make their own 'topics' to create data about. A single user or group might choose to make and share comments/issues in and about a location that concern them, for example street lighting or maybe even where is just 'nice to be', and instigate further opportunities for learning.

The app builds on the Twitter service by acting as a middleware for publishing the data and then for using the service to search the data and enabling other external services to search and visualize the data under examination.

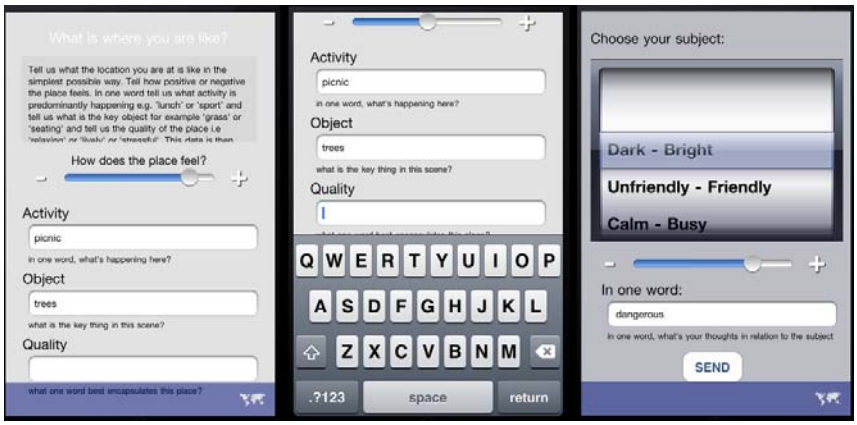

Figure 9: Located Lexicon App Interface.

In the trial version we have developed, we aimed to generate UGC in the form of words that reflect personal responses to the built environment and have used our previous infrastructure terms as a guide for this. At the top of the page, users are asked to respond to a general query that draws them into describing how they feel about their location using a negative to positive slider. This is intended to act as a trigger into providing a little more detail about the location. We have used the bottom level categories that make up scene type descriptors from the hierarchy for a 'treemap of terms' (Figure 7) to provide a framework for users to add their own words that encapsulate the activity, object and quality of the location. They finish the activity by selecting a value judgement from a scroll down list and again using a negative to positive slider to indicate a mark on that continuum. For example, if the location is crowded they would select the 'calm-busy' value and then move the slider to the appropriate position depending on whether they liked the crowds or not. This is supported by them adding a word to describe the overall location.

CONCLUSION

This project has developed two methods that potentially engage crowds or large numbers of people in generating descriptions of place. The first, a search-and-visualise app from Experiment 2 is based on searching USG in Twitter and Flickr for infrastructural terms associated with the built environment. We have started to explore how commonly used terms used to name features of the built environment can be used to generate information about the way people feel about place. This method is based on setting a search using an application that trawls for the occurrence of one or more terms in the content of one tweet. On finding these tweets, the app then plots where they were posted on a map. The map has been designed to visualise nodes of tweet content, mobility of users and location of posting in real-time using live feeds. As such, the infrastructural terms, perhaps considered banal and insignificant in design, can be argued to be important cues in searching UGC for descriptions of place.

This experiment also revealed the time-specific nature of searching UGC services; there is a limit on the scale of search depending on user traffic and popularity of search term. This is not, however, necessarily a negative when thinking about setting up learner-led enquiries or projects using the search-and-visualise app. It is just important to consider timescale as a creatively constraining feature of the activity.

The second method, from Experiment 3, is an application that has been specifically designed to encourage participants to input descriptions of place that contribute to collective visualisations and is based on sets of values associated with describing elements of the urban environment. These values act as triggers to engage participants in making a quick sliding scale judgment about what they like and don't like about a particular location and following this through by generating three words that describe it in different ways. The Located Lexicon app can potentially be reconfigured by users to set their own value judgements – for example, focused on a specific location or building or on a topic of special environmental interest – so that content generated can be used for different kinds of learning activity.

We have found that geo-location is not used effectively in existing UGC services. We suggest that is it possible to build on these services to increase uptake of geo-location that takes account of the privacy issues we've described. Our experiments have shown that the services could encourage people to write more about their location by focusing on text input and we have started to tease out how we might go about encouraging a mass of users to write more about location and therefore gather together a richer and localised understanding of place.

We have highlighted how happenstance and the chance actions of individuals operating as part of a crowd are integral to developing our understanding of place. The 'slices' through UGC that we have made do not pretend to be coherent nor whole, but instead defy a universal overview of place. Our experiments have shown that the temporal-spatial nature of multiple objects, people and activities being 'thrown together' can be momentarily captured by tools; tools that show the multiplicity of ways in which people, environmental processes and the urban infrastructure interact.

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VIRTUAL TEACHING: THE PHOTOGRAPHY EXPERIENCE IN A SPANISH FINE ARTS FACULTY.

Yolanda Remacha Menéndez

ABSTRACT

Introducing virtual education as a new teaching methodology in photography classes has been very beneficial for the students and for the professor as well. The project consists in the application of a virtual platform in my classroom to help my students in several aspects. The platform help them to find administrative information about the subject, have virtual contact with the professor or their classmate, notes, bibliography, upload their works and fill up the exams. The platform is also very useful for the professors because we can have easily statistics information about the progression of our students, offer attractive exercises to them and so on. One of my conclusions is that the students learn easily with e-learning method. They appreciate very much when you devote your free time to design the teaching to them and their motivations.

Keywords: Virtual teaching, technology, photography

INTRODUCTION

Our society is moving very fast and things happens quickly as well, we can have in our smart phones the news immediately, we can email to all over the world and, all those questions, affects in education. Teaching methodology is changing very fast, students are making big progressions, tools are different year after year and all those things must encourage us in our work.

I have been working with presence and virtual teaching for many years and every academic year is better than the past one. Photography is an optional subject and is the most elected in the faculty so it means that only students with the best qualifications are in my subject; it also means that I must give my best to the students. The subject has eighteen credits (next year it will change to ECTS credits), so it represents that I stay with my students six presence hours in classes and six hours in tutorial. I am in my office when I have tutorial but some of my students can't come to my office because they have other classes.

AIMS

The project has different purposes depending in the beneficial, the student or the professor. First of all is to help my students in their work and the second is to improve

my teaching.

The aim of this project, related with the students, is to write a photography technical term glossary, in order to learn the terms, know the meaning and the practical application. In previous times, this task was a memory exercise that was forgotten after the exam. In that way, they improve their computing competences. I also want them to develop the writing competences in words related with technology and to encourage their English competences too.

The aim related with the professor is to improve my work but with the purpose to help my students. I have been working in on line projects several years and I have been designing them with different aims. The main one is to apply a new teaching method that complement my labour and help the students in some activities. I always offer a space to the students so they can obtain some subject information that normally is been presented in paper: syllabus, lessons notes, etc. in such a way that contributes observe environment making "print friendly". The beginning was a very hard work for different things: first of all, because I had to learn the software as administrative profile and after that explain it to the students; secondly, I had to digitalized all the documents so I had to spend a lot of time scanning articles, books chapters, exercises, writing questions for the exams, the syllabus, etc. I also design an agenda with updated exams, days in the photography set, interesting photography exhibitions to visit; links related with photography and a RSS news daily updated about Arts published in an Spanish newspaper.

The time spend in this part is proportional inversely time after time, it means that in the beginning you need to spend a lot of time working and the results are very slight, but time after (months or year) you don't have to make all the same work because it is done and the time expend in the software is less than in the beginning.

The material part is so tiny that it is summarizes only in the virtual education software and this could be free as Moodle or Sakai, very good platforms to work with. Of course, I don't include the time expend in it.

ACTIVITIES

The main one is a glossary about technological words related with photography. The students must make a dictionary including definitions and photos of different elements such as cameras, set lighting, photographers and so on. They had an extra point if they included the English reference. It is a very useful tool because the student spend time searching the definitions, pictures, reading and after all they have to write it so they are studying without effort.

They can upload as many definitions as they want, they can do it at home or elsewhere, they can do it any time until two weeks before the exam, they can read all the concepts written by their classmate. At the end, I make an exam about all the definitions written and I also make qualifications about each term of the glossary depending in the

quality of it (nice definition, inserted pictures, English, links, et) so they will have two notes: the first one is from the exam and the other one is from the quality and quantity of their terms.

Another activity is to investigate about a photographer selected by them, they explain the work of the photographer to their classmate in the classroom; in that way, everyone have deep knowledge about "his/her" photographer and they learn about some others photographers. When the work is done, I upload the material in the platform so they can watch again all the work whenever they want.

All the students make exercises about different photographic techniques and a personal project, I also upload all these materials so all the students of the subject can see the work of the others. This is very interesting because they can learn about the others and they can compare their work and the qualifications.

One of the works made with on line software is the theory exam. It can be design in different ways: it could be fill in by writing in, by choosing an answer or more different types. I had a bank of questions so every year I choose one by one and make a specific exam for those students. The hard work was done time ago and now I only had to click in and select the questions. Every year I include some more questions to bring up to date.

It is possible to design in the platform to shuffle the questions; it means that my question number two is not the same than the student near me. It is possible to shuffle the answers as well, for example, if the students look the other exam and they are in the same question, the answer it could be placed different (A instead D, for example).

The nice thing for the professor is that, if is a multiple choice exam, the result of it is given in the moment to the student. They can see the wrong answers and check which one is the right one. The statistics is a very useful tool because I can see different aspects; for example, see the questions that represents more difficult for the students based in their answers and check what had happen, see a specific questions in all the students and compare the results and, of course, see every student exam.

This year I have been recording in video some photographic procedures that we call "educational pills" and they are uploaded in the system to be watched by the students. These *pills* are about specific dealings, for example, how to construct a pinhole camera, the video explain the materials needed and show how to do it. This is very helpful in two aspects: to the professor because I expend the time with them in making the pictures and solving questions; to the students, because they can watch the video wherever and whenever they want.

RESULTS.

The result of this experience has always been marvellous because they learn a lot and has been exceeded the expectations year after year. One of my conclusions is that the students learn easily with e-learning method. The other one is that they appreciate very

much when you devote your free time to design the teaching to them and their motivations.

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Section 5
Social Spaces

The Breaking of the Circle.
Playing with, through, against medial boundaries.

Wey-Han Tan

ABSTRACT

Digital-networked games are created to foster a desired pattern of behaviour in their users, beyond the mere delivery of content, a trait shared with many innovative digital media developments.

This can be seen as an opportunity for creating media for better learning, or rather teaching, but there will also be ideological, propagandistic or commercial (mis)use. What is necessary is a broad approach in arts, ethics and aesthetics to target and tackle the permeating structures behind the obvious content, and hint on playing with medial borders - named here *second order gaming* - as an anarchistic, radical counterpart to rule-conforming, more conservative gaming and game design.

First order game - and media - design aims for a delivery of the content as challenging and as balanced as possible, to draw the player smoothly into the confines and safety of the 'magic circle' of play. Alternatively in its second order form design may point to the 'magic circle' as a place of necessary manipulation and the player's potential power over this manipulation as player/designer.

Keywords: Games, Play, Medium, Education, Media Theory, Media Education, Medium Design, Unusability, Metagaming, Transmediality, Pervasive Games, Gamification, Second Order Gaming.

Johan Huizinga once claimed that play takes place in a sacred place, a 'magic circle' that brings into "an imperfect world and into the confusion of life (...) a temporary, a limited perfection" [1]. Delivering this limited perfection of inherently meaningful choices seems to be the trademark of good game design: challenging and guiding the gamer at the same time, like a benevolent teacher. But what if the teacher isn't benevolent?

A well-received medium usually stays invisible while its workings and limitations run smoothly along with our expectations and experiences: It provides a 'magic circle' within to interpret and act, to learn, communicate and store. But what if the 'magic circles' are slowly dissolving, if ludic forms and functions diffuse into 'serious' applications and vice versa? If games can foster specific patterns of benevolent behaviour and attitude [2] they may be also effective as tools for manipulation and propaganda. Caillois [3] claimed that any contamination of play - not of gaming - by 'ordinary life' destroys it; so, by a reversal of this relationship, could there be creation instead of destruction? Playing impli-

cates that one can change between alternating points of view, action, and empowerment [4], and tends to remove the very nature of the mysterious, turning it visible [5]. The changing definition of game and play, where they can be found, for what purpose they are challenged and who is involved, are challenging topics for arts, ethics and aesthetics.

'MAGIC CIRCLES' AROUND US

When we set up chess pieces, open a good book, or partake in a seminar, we are about to enter an area defined conceptually, socially, temporally and/or spatially as something special, for and by the means of certain occurrences to be interpreted and acted upon differently than outside of it: Seeing a set up board of chess and someone who moves a piece according to the rules indicates that we are involved in a game of chess; it is an invitation to join in a dialogue in the specific language of this game, with its own grammar and vocabulary. Like the board of chess,

> "(the) arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged round, hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart. Inside the play-ground an absolute and peculiar order reigns. Here we come across another, very positive feature of play: it creates order, is order." [6]

These are the classic well-defined 'play-grounds' that facilitate expression and understanding by ordering and limiting their respective range. They have perceptible markers that make us aware of treading on different ground, and implicitly or explicitly provide the rules we have to comply to, to get or to be inside.

As adults we are usually confronted with established 'magic circles', i.e. with balanced, culturally integrated games or given rule systems. As children and in the mode of *toying and playing* we generate and modify these circles. By isolating and simplifying areas of 'given' reality, we isolate and amplify a specific aspect and open it to experiment and personal adaptation. It resembles a procedural slight-of-hand satire of reality. E.g. children's roleplaying of domestic settings extract specific aspects of relationships to be modified or mocked. Vygotsky gives an example of a 'game', where

> "(...) sisters playing at 'sisters' (...) they are both concerned with displaying their sisterhood; the fact the two sisters decided to play sisters makes them both acquire rules of behaviour. (...) Only actions which fit these rules are acceptable to the play situation." [7]

Sutton-Smith argues that this is less the (re)playing of a given game but rather the result of generating one, of creating meaning beyond mere experience [8]. While growing up the awareness that there once was a mode and joy of *playing* this strange state of 'sisterhood', rather than just living it, will probably diminish.

Game proposal: If you are in a social setting - like being at a conference or sitting in a seminar - try to imagine rules to turn this setting into a game. How do you - and should all others around you - play "conference" or "seminar"? Try to look at it with the eyes of a child who wants to mimic these strange happenings. Are there conclusive rules, goals, winners or losers?

Examples: "cops and robbers", "cowboys and red indians", "house"

MEDIAL IMPRINT, TRANSPARENCY AND EXPRESSIVENESS

Huizinga's 'magic circle', a 'place' that imposes a certain mode of perception and action upon its visitor, resembles the idea of a medium. As McLuhan puts it: "(...) any medium has the power of imposing its own assumption on the unwary (...)" [9]. There are three attributes of media that are worth looking at, to understand how this imposition works:

First, media are *generative*. They are not neutral, passive containers, but imprint their characteristics upon their content. The limitations that span a defined space of expectable and expected possibilities *is* the medium, it is the first and foremost message delivered. Second, established media become *transparent*. A medium functions best when it is not perceived as such, but stands back in favour of its obvious content, remaining beyond the threshold of our conscious perception [10]. We perceive a medium *as* a medium only if it unexpectedly limits our expression, if we are unaccustomed to it, and/or if it malfunctions.

Third, media are *expressive* content - "the medium is the message" [11]. A medium can change - or be changed - over time, it can be expanded, invented anew, corrupted, appropriated like its contents. A medium is thus per se a dynamic form, though for technical limitations or socio-cultural ease-of-use it is usually seen as a stable given.

For future digital-networked media this means that media will be intentionally *created* to elicit a specific kind of use and response, to foster a desired pattern of behaviour by their users, beyond the mere delivery of content. This can already be seen in services like Twitter, Facebook, or the Kindle e-book reader, which change the notion of 'communication', 'community-building' or 'reading' by technically both expanding *and* limiting the acts, and by altering concepts of 'message', 'friendship' or 'property'. Subscription based online games can be seen as prime example for the deliberate encoding of a medium to send the superimposed message "do not stop playing" [12].

The attributes of generativity, transparency and expressivity may be especially perceptible in created digital new media, where the lag between novelty and cultural adaptation is quite short. These three attributes will thus be the starting points for a proposed approach to media studies, based on reconfiguration, transgression, transfer and malfunction, encountered and applied by users and designers of media in form of metagaming, pervasiveness, transmediality and unusability.

Ubiquity in computing, combined with converging concepts of learning, playing, working or communication, means not only omnipresence but also omnifunctionality. The 'magic circles' are becoming harder to distinguish, their protective, guiding, ordering and differentiating functions are changing. Games may not only be used as environments for enjoyment, expression and experiment, or as an 'occuring' socioculturally or individually stabilising entity [13]. The circle has been opened: Games and aspects of 'ordinary life' converge by deliberate design.

GAMES AS MEDIUM FOR EDUCATIONAL CONTENT

Games seem to be the ideal medium to deliver content to the user, educational or otherwise: they are highly contextual, are inherently challenging, motivating, gratifying and emotionally involving; they may support an active, integrated experience based on meaningful choices; they may adapt and react to the users actions; they require and reward specific patterns of behaviour like collaboration, networking, or the quest for mastership [14].

Games may achieve this not just by confronting the player with information, but by exemplification and support of the generation, communication and application of information. Games are not just descriptions of forms, but also the space where potential formations take place and are challenged to *happen*. In short: While classic media deliver structured information, the potential of games lies in the provision of an authored structure - a medium - for the experimental, safe, meaningful and joyful *formations* of structured information by the user.

This usually does not take into account that the games we successfully play do have the same shortcomings as any other medium: They are usually accepted 'as is', as a creation of a benevolent designer, without challenging the games' function or their mode of operation. In fact, this would hinder the flow of the gaming experience. We are trained to not-see the diverse 'magic circles' as a part of our socialisation and cognitive development (as Piaget [15] can be interpreted) - a necessity for participation, but an obstacle for criticism or change.

SERIOUS GAMES, GAMIFICATION AND LUDIC DESIGN

There are trends to exploit these characteristics of gaming. Ludic design and gamification strive for interfaces which are game-like, enriched with game features, or which aim for an aesthetic appeal beyond matter-of-fact design [16]; they aim for better usability by already existing familiarity with game interfaces and mechanisms [17]; or for providing gratification for showing a specific behaviour [18]. Corporations like Zynga already demonstrate that the workings of a vast social network can be exploited for casual games like "Farmville". Beyond this always-everywhere-game, whose purpose lies in self-propagation and monetarisation, there are visions of total permeation of game-like features to any area of human behaviour, to give it a nudge to a desired direction [19] by

mostly using a behaviouristic approach of action-and-reward.

This is, in itself, nothing to be afraid of, even if the approaches will grow refined and more subtle over time, and will see an increase in ideological, propagandistic or commercial (mis)use. What is necessary, though, is a broad approach in arts, ethics and aesthetics to target and tackle the permeating 'magic circles' and hint to *playing* - or higher order gaming - as an anarchistic, radical counterpart in contrast to rule-conforming, more conservative gaming [20]. As Piaget states, "(...) play begins at the point at which assimilation begins to dominate accommodation" [21], meaning that given aspects of reality may be reinterpreted, appropriated and jested for the sake of playing. Huizinga mentions

> "(the) spoil-sports (...) called apostates, heretics, innovators, prophets, conscientious objectors, etc. It sometimes happens, however, that the spoil-sports in their turn make a new community with rules of its own. The outlaw, the revolutionary, the cabbalist or member of a secret society, indeed heretics of all kinds are of a highly associative if not sociable disposition, and a certain element of play is prominent in all their doings." [22]

As in the tale of the emperor's new clothes, the 'magic circles' are aspects of reality that have to be 'seen' as just a potentially insubstantial social agreement to turn them into something to play with.

> *Game proposal: Agree on three digital texts influential for your area of expertise, run them through Wordle (www.wordle.net) and select the ten most common terms; alternatively you may agree on the ten most important terms for your area of expertise. Arrange alternating three-minute question-and-answer-settings where one player gets interviewed by the rest of the players. During the interview, the latter is not allowed to use the ten terms and scores negative points for every mention of one of them.*

Examples: "black-white-I-you-yes-no-game", "Bullshit-Bingo", "Taboo"

STEPPING ON 'MAGIC CIRCLES'

Game design may thus follow two roads. One is to deliver the content - the game, as we usually perceive it - as challenging and balanced as it can be created, to draw the player smoothly into the confines and safety of the magic circle. This is the classic path of game design. Or alternatively it may hint on the 'magic circle' as something expandable or mobile, where potentially everything can be played with, where the decision to take the game serious in its given form is up to the player.

Metagaming and transmediality are two ways for the player to turn the game into a toy, or a resource to create other medial forms. These actions focus on the expressive and generative attributes of games and media.

With metagaming a game's frame of reference is temporarily or indefinitely tran-

scended, modified and embraced anew. Among the modes to achieve this are mundane features like menu functions, cheats and walkthroughs, more complex semantic or systemic approaches like exploits and emergent gameplay, and also approaches that require technical skills, like skinnings, modifications, extensions and conversions. Metagaming allows the player to modify her gaming – or learning – experience by self-setting goals, tweaking rules, integrating game-external personally meaningful material into the game's mechanisms and narratives, and share the results with other players [23].

Transmediality describes processes of 'transferring' content and context of one medium to another. The concept of 'medium' used here is not restricted to a technical medium like print, photo, film, but covers any means of expression bound to a given medial grammar and vocabulary. Genres, tropes and stereotypes for example can be seen as conceptual media, where an artificial limitation of expressive range supports authorial creation and the users' re-creation of meaning [24].

These actions imply that the user is aware of these possibilities and is inclined to play with them. But how can one challenge creative "spoil-sports", "heretics" or "conscious objectors", as Huizinga calls them? I would like to propose two ways to achieve this: By participation in or witnessing of pervasive gaming, and by participative confrontation with unusable games.

> *Game proposal: Take a dear theorem or practice of yours, turn it into a story and mail this story to your neighbour. Let him or her turn this story into a game and describe its rules and goals to the next player. Repeat this with the description of a painting, of a serious software application, etc. and finish, again, with a story. Compare original input, tweenings and result.*

Example: "Chinese Whispers"

PERVASIVE GAMING

If ubiquity is the calm working of digital devices everywhere, anytime, intermeshed with any social or technical function, then gamification is its ludic counterpart.

Ubiquity would mean the expansion of digital-networked media's 'magic circle' beyond the line of sight, already a problem recognized by media ethics [25]. Pervasiveness is the playful, sometimes anarchistic side of serious gamification, a way to turn a previously transparent circle unexpectedly opaque. Pervasive games are the result of unauthorised appropriations of temporal, spatial or social aspects of the ordinary world. As Montola puts it:

> "When the three expansions of pervasive games are taken to extremes, the 'magic circle' starts to lose its meaning as a contractual boundary between ludic and ordinary. Extreme temporal expansion leads to ordinary life be-

> coming a pervasive game. The same happens with space if the ordinary world is seen primarily as a game world: There cannot be a game world without the ordinary world. And, finally, a game where everyone is only an unaware participant is no longer a game." [26]

Examples for this transgression, again, can be found in children's play: innocent pedestrians become welcome obstacles in a wild game of tag; cracks in the pavement provide for a game of improvised hopscotch; or the city turns into the background for a scavenger hunt.

Modern incarnations can be seen in the reinterpretation of urban architecture as playground and stage [27], as a playing grid in e.g. "Pacmanhatten" [28] or an obstacle course in street minigolf or "Urban Golf" [29]; in a global scale as "Geocaching" [30]; for cyberspace as contested resource in "Nethernet" [31], or as parcour in "Wikirace" [32]. Temporal or social boundaries may be transgressed in a milder variation of the game of assassination [33] in "Cruel2BKind" [34], or in alternate reality games like "World Without Oil" [35]. Artistic interventions by e.g. Aram Bartholl, Gonzalo Frasca, Stephanie Rothenberg rely on the effect of unsuspected but playful permeation of the real and the virtual.

The playful appropriation of public or private property, real or virtual, can also be quite low-levelled and mundane: forum trolling or the hijacking of comment threads [36], at least when creative instead of destructive, can be seen as an invasive but playful form of political statement or aesthetic intervention.

When done in public, these actions can be a reminder for spectators that 'magic circles' are generated and generatable anywhere. The confrontation may elicit reactions ranging from disregard to spontaneous participation, from annoyed irritation to joyful amazement.

> *Game proposal: Every player gets five tokens. The game master writes down three different activities on as many strips of paper as there are players, to be randomly drawn by them. Of these activities one can be performed alone, i.e. mentioning of a specific, unusal phrase, term or opinion in front of someone (+1 point); one that involves another person, i.e. speaking about a specific topic (+2 points); and one that another person has to perform, i.e. taking a stance against a specific topic (+3 points). Set a time to stop - or do not. Every player has to fulfil the three tasks without the others noticing it. If someone witnesses such a try - or thinks he or she just did so - a "Gotcha!" may be called. But if in error, the caller has to give the accused one token (+1 point). This game is played while other activities take place.*

Examples: "J´te gage que…", "Erwischt!"

UNUSABILITY

While designers of digital devices and software aim for usability, i.e. medial 'invisibility' of their products, unusability can be seen as benevolent sabotage detrimental to the smooth use and working of the target [37]. Unusability as an aesthetic or educational approach strives for the user's - maybe unwilling - understanding of medial limitations and preconditions, by aiming for irritation, wonderment and a disruption of trust in them. This happens through design decisions which deliberately and unbeknownst by the user turn a device, program - or game - unworkable, aporic, disbalanced and disturbing, where it should be intuitive to use, guiding, fair and entertaining. Though unusable games are in their carefully created dysfunctions as manipulative as usable games in their smooth functioning, the unusable ones do not provide a setting how to resolve the higher order problem within the given game. Within the unusable game, there is in the end no other course for the player than to decide *not* to play the given game any more.

Unusable games may pronounce their intention beforehand like Frasca's "September 12th - a toy world" [38], or draw their effectiveness from the ignorance and trust of the players like in "Barnga" [39] or Shirt's famous "Starpower" [40]. The proximity to acidic satire, like Wong's description of the perfect war simulation [41], is obvious. Any game rendering a specific feature of form or content into a caricature, so overdrawn that it hinders satisfying play, may be seen as generating unusability.

If in a game we regret acting like we did, usable games give us a chance to do better next time, to adapt to the conditions of the game. Unusable games force us to repeat the same regrettable actions over and over, until we regret playing the game as it is, i.e. without alterations of its rules or its narratives to do better. In contrast to pervasive games that may include passive bystanders into the game, unusable ones effect only active players, according to Will Wright's statement that games are probably the only medium holding the users responsible for their actions [42] - and thus also gives the chance for personal guilt, anger or grief.

The upsetting of trust, in either unusable form or content, may in its more radical variants intentionally trigger irritation, frustration, fear, or aggression, thus part of the game concept should include helping the player to cope with the experience, or helping to understand the rationale behind the approach. As an aesthetic or educational design decision, this may also raise questions whether it is ethical to confront players with the fragility of 'magic circles', especially if individual blind spots or socio-cultural taboos are touched.

> *Game proposal: Decide on a popular game from the genre 'war', 'fight', 'sports' etc. and add everyday complications omitted for sake of simplification and playability, until the game has become unplayable [43]. Alternatively join a forum supporting an extreme political position. Try to*

get a regular user to distance him- or herself from a thread's dominant statement by means of over-affirmation [44]. No discernible trolling is allowed.

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Online Social Networking Sites in Education: A case study of ntic-edusocial group

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ABSTRACT

This paper presents a case study about the use of online Social Networking Sites in educational settings. This study seeks to identify the main possibilities and limitations for learning in a Networked Space.

The exponential growth of social network users has made these services one of today's main communication channels. Currently, social networks have integrated themselves everywhere: at home, at work and while on-the-go. From the educational field, the social impact acquired by online Social Networking Sites is seen as an opportunity to improve students' learning experiences.

The case study consisted in the integration of social networking into a graduate course for the purpose of building a sense of community, as well as improving communications and interactions between students and teachers. The aim of this work is to provide a better understanding about the impact that the use of Social Networking Sites has on learning and teaching methodologies, as well as on the role of the teacher and the students.

The undertaken study follows a qualitative research approach, involving the use of surveys to the course participants, as well as analyzing the interactions that took place in the course's Social Networking Site.

Keywords: Social Networking Sites, social groups, higher education, participation, communication

INTRODUCTION

Social networking sites (SNSs) have become a ubiquitous part of many students' lives[1]. Probably, this is not the first time we read a sentence like this. The changes in technologies are driving changes in human behaviour, interactions, and knowledge acquisition. Currently, almost everyone seems to be a user of SNSs, especially Internet users under the age of 35. Obviously, there are differences among Internet users, so there are, and there will be, groups that for several reasons do not participate in these platforms. However, something I realized, at the time of deciding the communication tools I would use with the students of Social Education, in the course "New Technologies of Information and Communication Applied to Social Education", was that students were not the only ones who participated in SNSs. I was a user as well, and in some cases, of the same

1 The economist. Social networking. http://www.economist.com/debate/overview/123

platforms. This was the starting point of, let's say, an experiment to see if the use of a SNS in a formal education setting could improve communication and participation between students and teachers.

Educational pedagogy has swung over the years between focusing on individual-centered learning, group learning, and peer-to-peer learning. Approaches that value the last one, implicitly value and promote the creation of social networks. These ideas, aren't new. At the beginning of the XXth century, there were many educational movements that claim the importance of peer-to-peer learning (in Catalonia for instance, this was a central idea of educational reform movements such as "Escola Nova"). There's no need of technology to talk about social networking, as far as we understand the last one as the practice of expanding knowledge by making connections with individuals of similar interests. Clearly, the rise of SNSs has reinforced the value of social networks. So, according to Dana Boyd, the pedagogical value of social networks is not debatable. *If there is pedagogical value to encouraging peers to have strong social networks, then there is pedagogical value in supporting their sociable practices on SNSs*[2].

Social networking technology can be defined as tools that facilitate collective intelligence through social negotiation when participants are engaged in a common goal or a shared practice. Smith (1994) used the term collective intelligence to describe, *how groups of individuals can occasionally and under particular circumstances meld their thinking into a coherent whole*. The value of social networking has also been defined as the collective power of community to help inform perspectives that would not be unilaterally formed, that's to say, social networks can be considered as a means to harness the "wisdom of crowds" (Surowiecki 2004). Although these concepts refer to communication and collaboration processes that can happen in any network, since the Internet facilitates and allows a great development of collective intelligence it is a particularly relevant tool for collective knowledge building. As Rheingold (2003) pointed out, *connected and communicating in the right ways, populations of humans can exhibit a kind of collective intelligence made possible by the Internet*. According to this, the implementation of a SNS in an educational context can provide the technological support for groups to move towards collective intelligence in a learning environment, that's to say, a shared space in which a group of individuals can develop a sense of community, discuss an issue of interest, and reflect on practice.

When dealing with technology, it is important to consider that tools not only mediate communication, but also have an impact on users' way of thinking. As Joinson (2003) observes *tools are more than just something to make a task easier. They change your way of thinking, of approaching a task (and indeed the nature of the task itself), and can reap unimagined wider social changes*. Vygotsky (1978) referred to this as "mediation" and argued that when we interact with each other using tools we allow for the extension of human capabilities. Therefore, the social networking tools we use will change how

2 Boyd, D. The Economist Debate on Social "Networking". Danah Boyd, Apophenia. January, 2008. http://www.zephoria.org/thoughts/archives/2008/01/15/the_economist_d.html

we think, how we learn, and how we interact with each other.

The core of the debate about the benefits of SNSs for learning deals more with innovation and methodology rather than technology. According to Levis et al (2010), social networks help building meaningful spaces (educational, affective, social...etc.). Therefore, SNSs can contribute to the establishment and strengthening of relationships between members, in face-to-face and virtual modalities. The possibility of sharing experiences and interaction with classmates can make SNSs an alternative channel when students face-to-face meetings are difficult to arrange or when their schedules are incompatible. As the authors note, learning networks present the following strengths:

- Favour group activities by areas of interest.
- Facilitate interdisciplinary work.
- Encourage horizontal relationships between teachers and students.
- Foster the design of dynamics of collaboration and cooperation.
- Promote collective knowledge building.
- Accentuate the sense of belonging, encouraging the creation of teaching and learning communities.
- Demolish classroom walls.
- Allow the publication and sharing of documents in multiple formats.
- Offer a versatile communication platform that allows different modes of online interpersonal communication, public and/or private.
- Promote a better use of prior knowledge and interests of students.

Learning networks, extended by web 2.0 tools and SNSs, can significantly change traditional learning paradigms. The introduction of participatory processes such as the progressive combination of synchronous and asynchronous communications as well as interactive and collaborative learning has an impact on the classroom model. The use of these tools in education undermines the idea of teaching as an unidirectional activity. However, as Papert and Resnick (1975) already warned, the challenge is not in using the tools correctly, but in being able to build meaning with these tools.

COURSE DESCRIPTION

The implementation of the SNSs on which this study is based was in a graduate course of the Diploma in Social Education. The course was "New Technologies of Information and Communication applied to Social Education".

The content of the course was focused on ICT and its application to learning and teaching. The general goals of the course were:

- Promote critical, effective and efficient use of technological resources in teaching and learning situations within the framework of Social Education.
- Introduce students to the core aspects of educational actions: planning,

development, use and evaluation of technology resources.

In regards to the objectives stated above, we considered beneficial for students to experiment with new tools, such as SNSs, in order to experience the possibilities and limitations of these platforms in educational settings first hand. In addition, the use of a SNSs was also an opportunity to achieve some specific course objectives as:

- Reflect on ICT and its social impact.
- Offer a broad view of the potential uses of ICT in the context of Social Education.
- Analyze and evaluate audiovisual and online media for education in general and Social Education in particular.
- Develop the students' professional criteria to facilitate decision-making on the use of ICT and the design of audiovisual and online media in different contexts of Social Education.

It was a face-to-face course. The use of online services, such as the virtual campus and students' blogs used as e-portfolios, allowed communication and interaction with teachers beyond the contact hours of class as well as a space for content delivery.

There were 66 enrolled students, distributed into two classrooms of 33 students in each. Before starting the course, the two teachers agreed using a SNS, in parallel to the virtual campus, with the aim of allowing communications between both groups and improving student-student and teacher-student interactions.

As teachers and administrators of the SNS, we didn't want to force students to use the social network. Our intention was to offer another channel in order to allow a students to communicate more freely. Besides, as teachers and administrators of the SNS, We decided to leave the use of the last one quite open because we didn't want to overwhelm students with too many platforms (the course involved the use of, at least, three online services: the virtual campus, each students' blog and the SNS we wanted to introduce). Our main intention was to experiment with the new tool and evaluate if students feel more comfortable and proactive by using a more flexible environment, than the virtual campus. As students enrolled in the course were in the last year of the Diploma in Social Education, the use of SNS could help building an online community, and could thus be particularly useful in their future studies and/or careers.

SELECTION OF THE TOOL

We decided to use a service that allowed Social Network creation rather than popular applications on SNS such as photo, video and slides sharing because, as it is states in Jim Kent article "Social Networking Sites: will they survive?", users prefer to build a social network of friends first, and only later use the SNS to distribute content.

The SNSs had to meet the following requirements: it had to be a free service, user-

friendly with a fast learning curve, and it should allow users to: post messages, upload documents (in a variety of formats, especially audiovisual) and create groups. It should also include administration functionalities in order to follow and track users' activity. Another requirement was that the language of the interface had to be Spanish. Given this list of needs, the choice of possible tools was quite limited. Finally, we decided to use Grouply, mainly as besides meeting all the requirements, it offers a special plan for education that allows the free use of diverse functionalities.

Grouply was founded in 2006 by O'Reilly AlphaTech Ventures, SoftTech VC, and other prominent investors, including Reid Hoffman, one of the co-founders of LinkedIn. Grouply is presented as a "social group" online community that combines features of social networks and online groups. According to the developers' description of the tool, Grouply social groups offer the social interactivity, media sharing, and modern design of social networking sites like Facebook; and the rich discussions, popular email interface, and people-discovery opportunities found in traditional online group systems like Yahoo! Groups.

Every Grouply social group includes:

- Customizable community website.
- Activity feed.
- Unlimited group members.
- Blogs that can be tagged. Users can attach documents to posts.
- Discussion forums. Messages can have attached documents.
- File manager.
- Videos.
- Music.
- Chat.
- Classifieds.
- News.
- Events.
- Subgroups.
- 10 GB storage for photos and other content.
- App store with dozens of useful applications.
- Facebook integration.

In addition, Grouply for Education includes the following premium services:

- No advertising.
- Unlimited custom pages.
- Grouply Analytics.
- All premium Grouply applications.
- 20 GB storage.

The group we created in Grouply was named "ntic-edusocial". The two teachers of the course were the administrators of the social group and the students' role was as members. We decided to set the privacy of the group as public, so everyone could see and join the group. Our intention was to determine if by setting the group as public this would facilitate the interaction of students with people outside the academy interested in the topics of the social group. Among the applications and functionalities available on Grouply, we decided to activate the following ones:

- News.
- Discussion forum.
- Videos.
- Archive.
- Blog.
- Subgroups.
- Chat.

Despite the advantages we consider Grouply would have for the course, our choice was just for that semester. We knew the Learning Technology department was implementing and testing other SNSs connected with the virtual campus. We simply decided to use Grouply because, at that moment, it was easier and faster to implement not only for us as teachers and administrators of the social group, but also for students in their professional practice.

METHODS

In order to analize the impact of SNSs in a formal education setting, a case study was realized.

In the analysis of the case study, the sources of information and insight included:

- Knowledge of the course and the students stemming from my own participation in the course as an associate professor.
- Students' activity registered through Grouply analytics.
- Students' communications through the virtual campus.
- 23 student responses to an online questionnaire concentrating on how they evaluate the use of a Social Networking Sites such as Grouply in their learning process.

The method used to investigate the course relied in part on participant observation and in-depth analysis of the SNS interactions. The study combined quantitative and qualitative methods.

RESULTS

At the end of the course, an online survey was distributed among students with the aim of getting their feedback about the use of "ntic-edusocial". As it has been stated in previous sections, the implementation of a SNS pursued the following objectives:

- Observe if the use of a SNS increases students interaction as well as their participation in the course.
- Determine the impact of a SNS on students learning process.
- Understand how the introduction of on line social networks in educational contexts affects student-teacher communications.
- Foster the creation of a sense of community among students as future social educators.

In total, 23 out of 76 users answered the survey. This information was combined with Grouply analytics as well as my impressions as a participant in the experience. The results of the analysis have been grouped under five categories: students digital competencies, participation, uses of the social group, teacher-student communication, Grouply social group versus virtual campus and Evaluation of Grouply social group.

A. STUDENTS DIGITAL COMPETENCIES

First questions of the survey focus on the students familiarity with web 2.0 tools as well as with SNSs.

In general the majority of students (87%) had experience in content production and publication through online services such as blogs, slides and video sharing, among others. The same percentage of students had also worked collaboratively with applications such as googledocs, wikis... etc. However, their knowledge of tools for content syndication, bookmarking and tagging of resources was few as it didn't overcome the 13%. This difference could be explained by the fact that in previous courses students had been asked to write blogs and to collaborate through project manager applications, whereas the use of web 2.0 tools for documenting and classifying online resources had depended on students' personal needs.

In relation to the use of SNSs, before starting the course, the majority of students (87%) were familiar with some kind of social networks. According to their answers, the most popular SNSs was Facebook. Other sites mentioned were Tuenti and Twitter.

B. PARTICIPATION

To assess the participation of students, we took into account aspects such as users' own impressions about their level of participation, as well as Grouply analytics data about message volume and member participation. Information about member activity

was also included in the analysis.

According to the results of the survey, 61% of the social group members considered their level of participation has been average. The rest of the answers were distributed in lower scales of participation, 35% considered their participation in the social group was small and 4% answered it has been none.

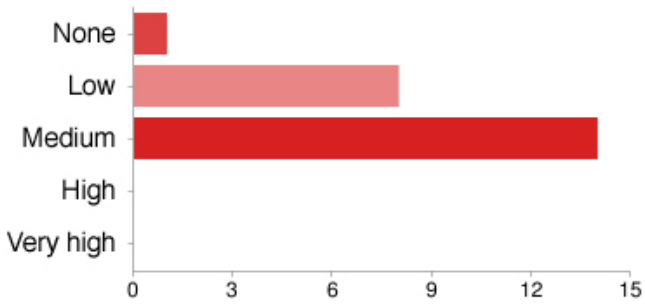

Figure 1. Graph generated with Google surveys from the responses of students to the question "how do you qualify your level of participation in the social group "ntic-edusocial"?

However, according to Grouply analytics, member participation, that's to say, the number of members who posted messages, didn't exceed the 26%.

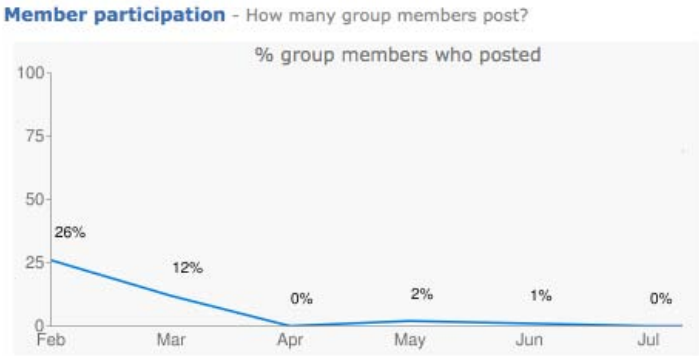

Figure 2. Graph generated with Grouply analytics about member participation.

In time, the message volume was distributed mainly at the beginning of the course (specially during February and March) and went down during the month of April (when there weren't any messages). There was a slight recovery of member participation in May and June[3]. This increase may be attributed to the teachers' interventions as community managers of the social group. The low contribution of the social group members may

3 The course ended in June.

be explained by the amount of deadlines and exams which concentrate at the end of the semester.

Figure 3. Graph generated with Grouply analytics about message volume.

Even though there was a low volume of messages and member participation, users logged into the social group quite regularly. The following graph shows how member activity was quite high during most of the course, concretely until May.

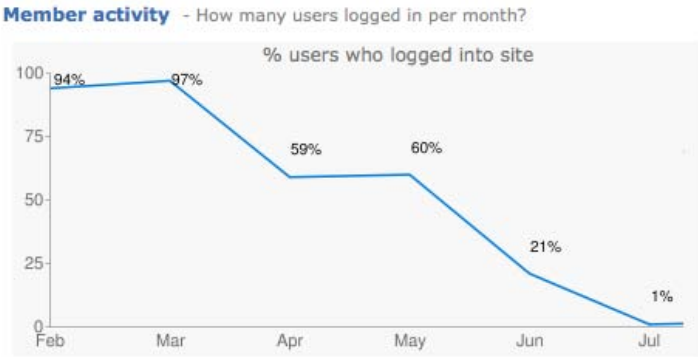

Figure 4. Graph generated with Grouply analytics about member activity.

Another aspects which shows students' use of the social group is the activity registered in their member profiles. According to the data obtained through Grouply analytics, the percentage of site users who entered profile information was over 64% during the whole course.

In general, the data extracted from Grouply analytics contrasts with students' perception of their participation. Analyzing students' answers, it seems their activity is quite passive as, according to their answers, participating in the social group is equivalent to regularly logging in, creating a profile and consulting posted information.

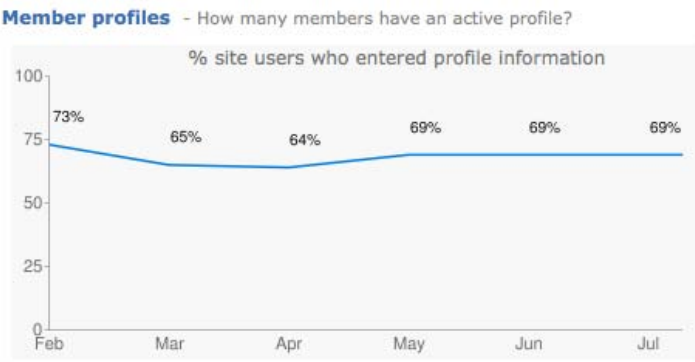

Figure 5. Graph generated with Grouply analytics about member profiles.

Another aspect related to users participation in Grouply social group has to do with the role of users that, despite not being enrolled in the academic course, decided to join the online group. As we have stated in previous sections, there were 66 people enrolled in the course "New Technologies of Information and Communication applied to Social Education". However, in the social group there were 78 members (two of them were the teachers). The rest of members were students that, for different reasons, couldn't get their enrolment at the beginning of the course (6) and users that created duplicate member profiles by mistake (2). Therefore, finally, there was only two users that join the social group without having any relation with the Academy.

In the online survey, users were asked for their opinion about the openness of the social group. On average, answers showed a positive attitude towards the fact that the privacy of the social group was set as public (everyone could see and join the group).

As it was stated in some of the answers:

- Marina: It seems me appropriate as it encourages participation and facilitates access to information provided by other users.
- Elisenda: It is useful because other people can consult the information posted in the social group, without the need of being enrolled in the course.

Despite the positive feedback, it must be said that the openness of the social group didn't have evident consequences. The two users that joined the group without being enrolled in the course didn't post any message nor participate actively in any debate.

C. USES OF THE SOCIAL GROUP

In order to analyze the utility of the social group in the students' learning process, we consider it necessary to identify main uses realized by members. The data interpreted in this section came from the users' answers to the survey and from Grouply analytics. Thanks to the last one, we could get information about the content popularity, that's

to say, which were the most commented and read messages, as well as the most usual message types of "ntic-edusocial".

In the survey, members of "ntic-edusocial" were asked to select different types of interactions they have developed during the course. It was a checklist that included the following options:

- Consult.
- Answer.
- Approve.
- Express disagreement.
- Add new information.
- Collaborate.
- Others.

According to the answers, members used the social group primarily to consult information (96%). Secondary uses were "add new information" (39%) and "collaborate" (35%). A 22% indicated they had answered messages as well as realized other types of interactions (without specifying which ones). A very reduced percentage (4%) approved other users messages. The interpretation of the data leads to a similar conclusion as to the participation analysis, since students main role was as readers and, eventually, as information producers.

Considering the aspects related with the content, the five most-read messages were seen, on average, by more than the 50% of members. There was a diversity of messages. The most usual types were discussions, blog entries, videos and news. The most commented messages were videos uploaded by the users. It's interesting to remark the value of the audiovisual material as it motivated discussions about the impact of ICT on educational settings.

D. TEACHER-STUDENT COMMUNICATION

In the survey, users were asked, through a Likert scale, if the use of a social group as "ntic-edusocial" had made easier and faster communication with teachers. Their answers showed that the use of a social group had a positive effect on the student-teacher communication. Concretely, 35% considered the impact was positive and a 30% that it had been quite positive. On the other hand, a 26% of users considered the effect was small, while a 9% evaluated it as none.

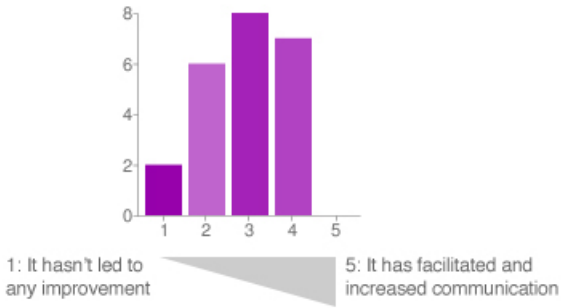

Figure 6. Graph generated with Google surveys from the responses of students to the question "to what extent the use of the social group has improved communication with the teacher?"

Generally, the kind of communications that took place in the social group among students and teachers were public. Private messages were sent through the virtual campus or through the mail box. Sometimes students sent private messages for asking general concerns that could be shared by others students as well. As teachers, in these situations we encouraged students to post this information in the social group. This way, the rest of students could join the conversation. In this sense, the lack of group communication culture in order to share information, put questions and solve doubts, was noticeable.

E. GROUPLY SOCIAL GROUP VERSUS VIRTUAL CAMPUS

During the course, the virtual campus remained the official channel. That's to say, all the course information that was posted in the social group was also available in the virtual campus. As teachers, our intention was to determine what differences were perceived by students between both spaces and if it had been worth creating a social group.

According to the results of the survey, 57% of students considered that the use of a social group presented some differences in relation to the virtual campus whereas a 43% of students didn't notice any.

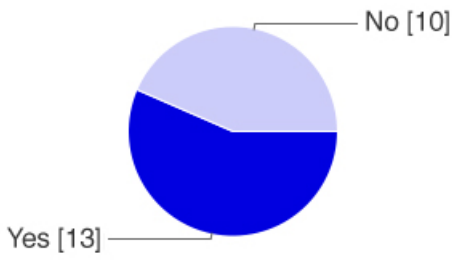

Figure 7. Graph generated with Google surveys from the responses of students to the question "Have you perceived any difference between learning through a virtual campus and a social group?

In the following question of the survey, students were asked to extend their impres-

sions about the differences between the social group group and the virtual campus. In general, students were satisfied with the social group. They considered it offered a more flexible space than the one provided in the virtual campus. As they stated in their comments, communication in the social group was freer and more multidirectional, that's to say, students were able to interact among themselves without the teacher's mediation. In addition, as one of the users remarked, the social group encouraged a sense of community.

- María[4][1]: *The virtual campus is a tool that allows presenting projects, realizing activities, as well as getting information from teachers. However, students cannot create new entries if the teacher hasn't created a specific space. On the other hand, the social group is a much more participative space where students can appropriate and manage information more freely. Personally, I think this is the biggest and best difference between both spaces.*
- Arnau: *The virtual campus is a much more unidirectional space whereas the social group changes this aspects and becomes a multidirectional space where everyone can participate.*
- Joana: *In the social group, dialogue between students has been faster as well as more direct and effective.*
- Miquel: *In Grouply I've got the feeling that I was part of the group as it was a much more communicative space*

Students also pointed out some disadvantages of the Grouply social group that made its use difficult. The main obstacle was they had to learn a new tool. As they were already familiar with virtual campus, for them it was simpler and faster to communicate and manage information through this channel rather than learning to use a new one.

- Andrea: *In the virtual campus communication with teachers and classmates, as well as uploading or downloading documents are easier.*
- Gerard: *The social group supposed much more work as it was a new tool I had to learn how to use every time I wanted to participate or work with.*

F. EVALUATION OF GROUPLY SOCIAL GROUP

In order to evaluate the value for the learning process of "ntic-edusocial", users were asked to rate, using a Likert scale the relevance of the messages posted in the social group. Also included in the survey, was an open answer question about how the use of the social group had affected their learning process. Finally, users were asked about the future of the social group.

In all, the majority of users (65%) considered the inputs in the social group had been relevant. 22% rated these contributions as quite valuable. On the other side, 13% attributed them little relevance.

4 The names of students that appear in the article do not correspond to their real names.

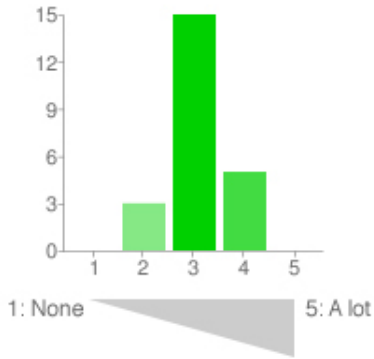

Figure 8. Graph generated with Google surveys from the responses of students to the question "Qualify the value of the members' contributions to the social group".

The answers to the open question "How do you think participating in the social group has affected your learning process?" provided quite positive feedback as well as some negative evaluations. In general, satisfied users pointed out the following ideas:

- Marc: I specially value the possibility of consulting my classmates comments as they have helped me deepening my knowledge in specific areas.
- Míriam: The social group has made the learning process much more participative and collaborative.
- Bernat: I consider it positive as it has brought me the possibility to experience personally the course theory and practice.
- According to the users' answers, some of the aspects that should be reconsidered are related to the duplication of spaces, extra work associated with the use of a new tool and the lack of participation.
- María: I think it has meant a lot of additional work. The coexistence of the virtual campus, the blog and social group produced some confusion at the moment of searching or asking for information to classmates as you never knew which the relevant channel was.
- Joan: I think there should have been a stronger use of the social group in order to make it meaningful for the learning process. Besides, it's complicated fort people to get familiar with the tool and use it proficiently in a short period of time.

Finally, users were asked about the continuity of the social group. As mentioned in previous sections, the course participants were in their last year of Social Education Studies. The creation of a social group was also an effort for building a sense of community that, once the participants have ended their academic studies, the social group develop into a Community of Practice.

At this point, students answers showed a clear unanimity. None of them considered that the "ntic-edusocial" social group would have a continuity in the future. However, it

is important to notice that the lack of continuity doesn't mean students do not consider it useful or even necessary.

- Marta: The truth is I consider it necessary to continue participating in the social group, although my experience tells me this won't happen. I think it's necessary in order to keep in contact with classmates, as well as to share knowledge.
- Núria: It would be ok to participate in this social network or in another one related with Social Education. This way, we could reflect about the professional practice and share our impressions with other social educators.
- Júlia: I would like to continue with the social group as a meeting point, although most probably is that nobody will participate once the course ends. I think this is due to the fact that the social group was created with specific objectives and goals.
- As students have noted, the lacking sense, amongst the participants, that the social group would continue can be explained by its specific goals as well as the existence of other social networks that students already use as group-communication channels:
- Pau: I don't think the social group will continue as the majority of us have used this tool as part of the methodology of the course.
- Joana: I really don't know. May be I would consider it necessary to keep in contact with classmates, although for this I already have Facebook.
- Mireia: I don't consider necessary to continue it as it's a tool used for the course. With classmates we are already in contact through other interactive tools such as Facebook. Concretely, we are using this social network in order to solve doubts and put questions about academic issues.

DISCUSSION

The analysis of the quantitative and qualitative data obtained in the study asks of us some significant questions about participation. Let us first look at how to understand the term "participation". What should be understood as participation? Should we only consider active participation or other types of online presence should be also included? According to an online survey of Forrester Research5 (2006), internet users can be segmented as "inactives", "spectators", "joiners", "collectors", "critics" and "creators", depending on the actions they perform online. Others authors, such as Aigrain (2003), have also noted the importance of recognizing different kinds of role-segments (e.g., "referrer", "communicator", "problem solver", "moderator" and "challenger") in order to identify users' motivations for participating according to the role-segment they were in a certain moment.

What these segmentation strategies highlight is that many people who are on SNS or online communities participate at very low levels of activity. Jacob Nielsen's 90-9-1 rule continues to provide an accurate description of online community participation. Quoting

5 Forrester Research, http://www.forrester.com/rb/research.

the summary of Nielsen's article "Participation Inequality: Encouraging More Users to Contribute": In most online communities, 90% of users are lurkers who never contribute, 9% of users contribute a little, and 1% of users account for almost all the action6

Certainly, this can be quite easily applied to the social group "ntic-edusocial". Active users were a minority, while the majority of members used the social group in order to consult information. This type of inactive users, "lurkers", have been described as users who, for a variety of reasons, choose to participate only passively (Nonnecke & Preece, 2003). In the context of social interaction, this group is of interest as lurking is one style of participation (Takahashi, Fujimoto & Yamasaki, 2003), therefore likely to have symbolic value within the intersubjective sphere of an SNS.

Although non-use is also considered a form of use experience, both users and non-users experience absence – either their own or that of somebody else – subjectively, which ultimately contributes to the perception of the meaning of an SNS. Considering that one of main strengths of web 2.0 services are the social interactions enabled by the service, "lurking" is not an attitude that contributes to the production of meaningful conversations, nor, consequently, for learning.

Recent research inspired by constructivist principles, views the quality of the learning process as being improved by the active participation of learners, whereby learners move from a passive role as information consumers to a more active one in which contributions are made, reviewed, rated, improved, and so on. According to this, the continuous commitment of learners to not only acquire but also actively contribute to knowledge is inherent to the notion of a Learning Network. As Fischer and Ostwald (2002) stated, learners' progression from consumers to active participants can be referred to as encouraging "informing participation".

> Informed participation is an approach for community-based learning and design in which all participants actively contribute toward the framing and solving of complex and multidisciplinary problems. Informed participants go beyond the information given to explore large problem spaces, learn from their peers, and create new understandings. Informed participation requires social changes as well as new interactive systems that provide the opportunity and resources for social debate and discussion rather than merely delivering pre-digested information to participants7.

One of the questions that arises from Nielsen's article is "How can participation inequality can be overcome?" In regards to Learning Networks, the answer to this question becomes a crucial one to achieve social production of knowledge. At some point, Nielsen's answer is quite pessimistic. From his point of view, participation will always

6 Nielsen, J. (2006) Participation Inequality: Encouraging More Users to Contribute. http://www.useit.com/alertbox/participation_inequality.html

7 Fischer, G. & Ostwald J. (2002). Transcending the Information Given: Designing Learning Environments for Informed Participation. Proceedings of ICCE 2002 International Conference on Computers in Education, December 2002, Auckland, New Zealand, 378- 381.

be somewhat unequal. This idea is not exclusive of Nielsen. As Josh Beroff, senior vice president of Forrester Research, points out:

But the future of social applications online will not include contributions from everyone, because not everyone has the temperament to create content. Don't count on all your customers to contribute, and don't believe that what you see online is representative of your whole audience. The shy among your customers are reading this stuff, but most of them aren't ready to contribute, and won't be for a while[8].

However, as Jacob Nielsen specifies, there are ways to better equalize different users' amount of online participation Some of the ways he identifies include making it easier to contribute, allow users to participate without asking big efforts of them, reward participants and promote quality contributors, among others.

Mechanisms for motivating and encouraging community members to participate have also been noted in research about social exchange (e.g., Davenport & Prusak, 1998; Tiwana, & Bush, 2000; Butler et al. 2002; Lui, Lang & Kwok, 2002; Vassileva, 2002; Obreiter & Nimis, 2003). These mechanisms can be also applied in order to promote participation in Learning networks.

Concretely, in the article "Encouraging participation" (Hummel et al. 2005) the following four are highlighted:

- Personal access, or anticipated reciprocity: the learner has a pre-existing expectation that he will receive actionable and useful (extra) information in return.
- Personal reputation: the learner feels s/he can improve his/her influence and visibility to others in the network, e.g. leading to more work or status in the future.
- Social altruism: the learner perceives the efficacy of the LN in sharing knowledge as a 'public good', especially when contributions are seen as important, relevant, and related to outcomes.
- Tangible rewards: the learners negotiate to get some kind of more tangible asset (financial reward, bond, book, etc.) in return.

In the case of the "ntic-edusocial" social group, created during the course "New Technologies of Information and Communication applied to Social Education", some reward strategies were used during the course. These included, quickly answering members' questions, thanking contributions, as well as suggesting resources according to users' specific needs. In some cases, some of the information posted on the social group was mentioned in face-to-face sessions. The intention was to create a link between online and offline worlds, as well as recognize the relevance of certain contributions. Sometimes, users were encouraged to share information or reflections expressed during face-to-face

8 Maas, P. (2009) "La web participativa ¿realidad o mito?" http://weblogs.clarin.com/economedia/2009/01/

meetings, with the aim of continuing the discussion in the online social group. Despite these dynamization efforts, users' participation didn't reach expected levels. In light of this, it would be useful to consider Preece and Schneiderman (2009) reflections on the progression of participation in online groups. In their work, they identify several segments of participation that go from "reader to leader". Each level is defined by different activities that characterize users' participation. Coming back to the participation analysis of "ntic-edusocial" members, the identification of these levels would be useful in order to achieve a deeper understanding of users' participation. Unfortunately, this kind of analysis would require more user insight than what we can interpret from the collected data. Ideally, our future SNS case studies can be designed to enable the relevant data collection for this kind of identification and analysis.

The use of a SNS in education asks that we reflect about community building processes. According to Wenger (1998), the community is a group of people who learn and interact together, building relationships that result in a feeling of belonging and mutual commitment. As pointed by Gunawardena et al (2009) *social networking tools can help to build community through dialogue and conversation, selectively making sense of past and present experiences*. The importance of these conversations relies on the "negotiation of meaning" processes that happen during these dialogues. Quoting Wenger (1998), n*egotiation of meaning is the process by which we experience the world and our engagement in it as meaningful.* In the case of SNSs, the negotiation of meaning happens when individuals advance their knowledge of a particular subject, develop a community with a common history and create a new cultural historical process. In the case of the social group "ntic-edusocial", it is difficult to evaluate if the conversations that happened were meaningful enough to lead to a community building process. As the answers to questionnaire show, students considered that users' contributions to the social network were relevant. However, the students' low degree of participation make us wonder to what extent those conversations were meaningful for them. In light of the users' answers about the continuity of the social group, the most realistic conclusion is that the social group created with Grouply wasn't strong enough to become a community. This leads to uncomfortable question: To what extent is possible to build a community that doesn't come out spontaneously? To express it differently, the social group creators weren't the students, but the teachers. Taking into account this starting point, it is quite natural that the social group "dies" once the obligation to participate ends. Quite probably, online social groups created by students live longer and have higher participatory levels than the ones that are imposed by teachers. Should teachers dictate the use of tools for learning or allow students choose on their own?. An alternative approach could be using tools that are already familiar to students. This way, they won't feel overwhelmed learning new tools in every course. Another option would be to connect these tools with the virtual campus in order to avoid proliferation of scattered learning environments. The answer is complex yet it is not within the scope of this article to provide a definitive solution. However, it's important to draw attention towards the need to reflect on these issues before introducing new tools indiscriminately.

Despite the amount of experiences with SNSs in educational settings, it isn't clear why should these tools be used in classrooms. Danah Boyd introduces some arguments that reflect a more skeptical perspective on this issue.

> I have yet to hear a compelling argument for why social network sites (or networking ones) should be used in the classroom. Those tools are primarily about socializing, with media and information sharing there to prop up the socialization process (much status is gained from knowing about the cool new thing). I haven't even heard of a good reason why social network site features should be used in the classroom. What is the value of knowing who is friends with who or creating a profile when you already know all of your classmates?[9]

Although there isn't a clear answer, it can be interesting to echo Jim Kent's words in order to answer Boyd's criticism.

> It has been documented that the majority of users did not join Social Networks in order to make new contacts but to manage, maintain and re-contact with extended physical networks. Ellison, Steinfield, and Lampe (2007) suggest that Facebook is used to maintain existing offline relationships or solidify offline connections, as opposed to meeting new people. In addition, Lenhart and Madden (2007) reported that 91% of U.S. teens who use SNS do so to connect with friends. This in itself is not surprising but remains useful evidence to distinguish SNS from previous sites which are focused on making new contacts[10].

In a face-to-face learning environment, such as the one in the course "New Technologies of Information and Communication applied to Social Education", the introduction of a SNS wasn't oriented to encourage students acquiring new contacts, but to interact with them in a learning environment. Discussion about whether the implementation of this tool was productive is open. However, one aspect on which students and teachers agree is that the official online environment of the course isn't flexible enough to allow students conversations.

Another aspect that tends to be addressed when introducing SNSs in education is collaboration. During the course, the social group was available for students as an online environment in which they could share information, express doubts, answer, make proposals... etc. At some point, there was a group activity in which all the students of one class should collaborate in order to present a joint product. The time left to prepare this project was two weeks. In order to realize the project students could use whatever tool they consider useful. The only requirement was that all members of the class should participate. Considering that not all the students had attended class all of the time, and that

9 Boyd, D. The Economist Debate on Social "Networking". Danah Boyd, Apophenia. January, 2008. http://www.zephoria.org/thoughts/archives/2008/01/15/the_economist_d.html

10 Kent, J. (2008) Social Networking Sites: will they survive? Nebula5.1/5.2

Easter holidays were in the middle of the working period, the social group had a good hypothetical potential for becoming a collaborative space. However, it didn't happen this way. Students only used the social group for sharing initial documents and, after this, they organized themselves in smaller groups that communicated through e-mail. According to Dillenbourg et al. (1995) reflections on the distinction between cooperation and collaboration, we can conclude that, in this case, students cooperated as the task was accomplished by the division of labour among participants, as an activity where each person is responsible for a portion of the problem solving, rather than collaborated which Dillenbourg et al. understand as the mutual engagement of participants in a coordinated effort to solve the problem together. At this point, it is interesting to refer to Stephen Downes' consideration of collaboration as characteristic of groups while cooperation is typical of a network. As professor Downes states, the significant difference is that, in the former (collaboration), the individual is subsumed under the whole, and becomes a part of the whole, which is created by conjoining a collection of largely identical members, while in the latter (cooperation), the individual retains his or her individuality, while the whole is an emergent property of the collection of individuals11. In light of this, we can conclude that the students behaved more as a network than as a group. When students were asked why they hadn't use the social group for coordinating and sharing materials, their answered that they preferred communicating by e-mail as it was faster and easier for working in small groups. Again, the debate about tools arises. Although students felt more comfortable using e-mail, their working process wasn't visible, so the teacher couldn't follow it nor make suggestions. The use of the social group would had helped maing the process much more transparent for teacher as well as students. However, can students be forced to use a particular learning tool?

CONCLUSIONS

The work described above presents a case-experience about the use of a SNSs for teaching and learning. The intention of this article is to share the results and conclusions of the case study in order to add to the imperative and reasons for an on-going discussion about some unsolved questions related to SNSs in education. Several aspects and issues considered crucial in the analysis of the above mentioned social group created with Grouply, were found and discussed. Specifically, the main issues relate to participation, communication processes, collaboration and community building. Though the use of the social group was considered beneficial, especially at the time of allowing in the way of furthering students' interaction as well as a more flexible teacher-student communication, the passive role of students generates some questions about participation. In relation to this, the literature review points some interesting approaches that can be helpful in further studies and experiences.

Although the initial objective of the study wasn't focused on collaboration, SNSs

11 Downes, S. Collaboration and Cooperation. Half an hour. April, 2010. http://halfanhour.blogspot.com/2010/04/collaboration-and-cooperation.html

can be a suitable environment for developing collaborative practices in an open way. However, as it was observed in the study, the use of new tools must be guided. This way, students will clearly identify what they can achieve by using that environment. Otherwise, the most normal is that they prefer using tools they already know.

Another conclusion of the study deals with the introduction of learning environments that are new to the given users. As far as each tool has its own learning curve, students – that's to say, users – must dedicate some time and effort in order to get familiar with them. At this point, the most suitable would be avoiding dispersion, that's to say, avoid using different spaces that have significantly different functionality and work independently of one another. In addition, the fact that students had to use a Grouply social group when they were already using other SNSs is another issue that requires deeper reflection. Taking into account the results of the study, it is clear that the selection of the learning tools requires a careful analysis in order to to prevent students from feeling overwhelmed.

The creation of a sense of community is a quite ambitious objective that goes beyond what can be achieved in a single course. However, it is interesting to consider that students were already organized through other channels, chosen and managed by themselves. Perhaps another approach to consider, when looking at Learning Environments, is how these "other channels" can be extended, or curricula changed, to make use of "other channels" as Learning Environment tools.

Finally, I hope that the work described here will help outline new lines of research related to the impact of SNSs on learning and teaching.

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Memory Palaces in Pocket Worlds

Owen Kelly

INTRODUCTION

This is not intended as an academic paper reporting on research that has been completed and analysed. Rather it is a blueprint that outlines the theoretical and practical basis for a project that we began in 2011 and are intending to complete, in its first incarnation, in the summer of 2012. This project is being undertaken by a team of staff and students at Arcada, a university of applied science in Helsinki, Finland.

We are presenting this blueprint at the Future Learning Spaces conference for several reasons.

Firstly we believe that the project is innovative and interesting and offers a way for e-learning to blossom outside of a curriculum based around e-teaching. Secondly, we are looking for fellow travellers who find the ideas discussed below exciting and wish to contribute, directly or indirectly.

Thirdly we are in need of informed criticism to temper and direct our enthusiasm.

Because of the nature of the project we have felt it necessary to include some background information and some reference to the results of research already undertaken. We have tried, however, to focus on our plans for the next year and the ideas that fuel those plans.

Keywords: reflection, learning, meditation, open-source, pedagogy, virtuality

ABSTRACT

Snowcastle Valley is a project that began in early 2011. It is an experimental virtual worlds project being developed primarily at Arcada, and piloted in conjunction with a junior school in the Kulosaari district of Helsinki.

Technically the project aims to create an innovative framework that utilises the ability of OpenSim to run locally on usb-sticks as well as on the web. Pedagogically it aims to develop a shared game-like galaxy that responds to rational enquiry, and that combines public and private spaces in illuminating ways.

The framework will act as a platform to support the development of (commercial and non-commercial) services for the delivery of learning and training resources. The project will demonstrate a working implementation of such services under the name Snowcastle Valley, which will act as a resource in its own right; and as a indication of what can be achieved using the framework.

BACKGROUND

A small team at Arcada first began working with virtual worlds in 2003, when the Media Department launched the first version of Marinetta, a fictitious mediterranean island intended to have a culture of its own. In October 2005 we launched version three, located in Second Life. This ran until 2009, when the project was ended. The Marinetta project was designed to examine a variety of possible uses of virtual worlds, and to analyse the educational value of extending the notion of a "second life" to include membership of a "second culture".

About OpenSim

In 2010 we began looking at OpenSim, an open source version of the Second Life software. The most important difference from our perspective is that OpenSim can be installed on any server. It is therefore possible to build and maintain worlds that are partly or completely closed to everyone except registered members. This means that children can use such a world safely from school or from home, knowing that all the people they might meet there are approved by their world's moderators.

In the summer of 2010 we spent time experimenting with the idea of running an OpenSim installation from a usb stick. Unknown to us, others were pursuing this independently, and much interesting information can now be found at simonastick.com.

About Snowcastle Valley

The original impetus for the Snowcastle project grew out of discussions with my daughter and her friends about one of the experimental virtual worlds that I was building, and whether or not it would be "better than Club Penguin".

In Summer 2010 I therefore began talking with the my daughter's class teacher about the possibility of creating a virtual world for his class to use. I wanted to see what the children would do if they were presented an empty world, and encouraged to explore and create whatever they wanted. He wanted to know which aspects of the curriculum the children might learn simply by playing and working together in this environment: what they might learn, in effect, without being taught.

It should be noted that the class is bilingual and some lessons are taught in Finnish and some in English. Our contact with the children was also bilingual, with some discussions switching back and forth haphazardly.

PHASE 1: THE PILOT PROJECT

In January 2011 We installed OpenSim on a server to create our own closed world. We also rented space on JokaydiaGrid, an open world for educators running built on OpenSim.

Together these give us a public face, a private lab, and a basis for experimentation. Together they enable us to compare what we are doing ourselves with what is possible on a well-run grid operated by someone with more experience of administering OpenSim.

We spent the first six months of the year learning how well the children cope with the software; how they approach the world; what they do there; and to what extent they prefer ready-made content to building things themselves. To some extent the answers surprised us.

Names and Naming

Children were given an avatar to represent them in the world. Some were given avatars with their actual name displayed. Some were given avatars with a name composed of random letters and numbers. Nobody questioned the use of their real forename. Complaints about the letter/number combinations dealt only on their pronouncability and the perceived possibility of them being embarrassing. No objections were raised to names like tiger65. On the other hand dumb12 was flatly refused as was zp87hg. The latter was declined because "it doesn't mean anything and you can't say it".

It was clear from the interviews that the use of names other than their own had no connection in the children's minds with issues of anonymity. They intended to tell their friends their online name and they wanted to avoid one with a perceived low status, or one that they could not pronounce.

Those interviewed were as willing to accept their own forename as their user name but they were not willing to accept their full name. As far as we could determine being called by their full name felt too formal, or removed the feeling that it was their space and they were in charge.

Figure, Ground and Medium

We needed to know whether the children were most interested in building things themselves or in being given access to a range of pre-built, customisable objects. To do this we conducted experiments in an empty plot of land in JokaydiaGrid, where we provided them with a range of free items, as well as showing them how to use the building tools to make their own.

It became clear that, inside the virtual world, the children made a clear distinction between themselves and their environment; and that their desires for the two were very different.

When focused on their avatar, they behaved as they might in real life. They carried over their opinions of fashion, and wanted to dress stylishly and "realistically". They were fascinated by the ready-made hair, clothes, shoes and jewellery and not at all interested in making any themselves, once they realised that achieving the same standard would be difficult or impossible.

When focused on their environment, however, they adopted the opposite approach. They behaved as they might when given drawing paper and pens. They rejected ready-made buildings in favour of fashioning crude blocky houses with the building tools. They were completely untroubled by the fact that (to an adult's eyes) what they had made was clumsy, and they spent several hours elaborating and embellishing, without ever pausing to think about realism.

We began to think about this in terms of a figure/ground model, until we realised in the latter stages of the enquiry that there was a third element involved. In the early phases both we and they had taken the terrain for granted. The hills and valleys, the beaches and shores, and the grass and trees, were all part of the initial world as it was presented. Neither we nor the children discussed them. However, on one occasion when we radically changed these, they suddenly became the focal point of the children's attention.

After investigation it became clear that we were more nearly dealing with a model in which the virtual world itself formed a third, equally malleable, layer to which attention could be drawn. It then became clear that the children were treating this in the same way as they treated their avatars: as a layer in which realism was essential to meaningfulness. This gave us an expanded tripartite model of figure/ground/medium.

Activity in the world

We made preliminary enquiries about the kind of activities that the users would like in the worlds. There were four categories that were universally popular: collecting, building, exploring, playing.

Collecting was viewed as a solitary activity that required a ready-made framework in the form of a 3D version of an album, or box. We built various alternatives, ranging from realistic gallery spaces to outdoor scenes with frames dotted around. The most popular was an outdoor square in which the advertisements and wall posters were configurable by the user.

The creation of such virtual places relates directly to two learning tools from other historical periods: the Palace of Loci and the commonplace book. We intend to explore these connections, and their implications, during the course of the project.

Building was popular with everyone and we were thus able to observe a variety of opinions by a variety of users of different skills. It became clear that many children required something between the native building tools and the ready-made items. They required a kind of in-world Lego through which simple ready-made parts could be combined into complex machines of their own devising.

This was not a result that we had foreseen and we intend to pursue it further.

Exploring manifested itself in a number of ways. Some children simply wandered around while others more purposefully hunted in the expectation of finding rewards.

Some were willing to repeat tasks over and over again if they thought a reward would follow. There were no rewards in any of the demonstration worlds. The reason some users imagined that there were was because they carried their knowledge of other game worlds (Pokemon, Club Penguin, Tootsville) into this experience.

Playing was important to all the users and was seen as a social activity that required their friends to be in the world at the same time as them, possibly alongside another group, who might be enemies or rivals. The play that interested the children required boundaries and consequences.

Some boundaries were literal: users wanted to be able to create walls that would keep others out.

Some were metaphorical. One child was very definite that "you should only be able to carry three things at once".

Consequences were also an important feature of play. Examples given included: if I capture you then you should stay captured until you are rescued. If I open a shop then you should give me money to buy what I am selling, so I can buy more.

We view these as important findings, in that they indicate that children cannot help but learn while playing in digital worlds, and cannot help but attempt to generalise this knowledge into new but apparently similar experiences. They also indicate that children, of their own volition, will attempt to make sense of a world provided that it is providing them with a satisfactory level of stimulus.

These are not new findings in themselves, but it is heartening to have confirmed our belief that a world does not have to be explicitly didactic in order to serve as a learning object.

PHASE 2: CREATING AN INITIAL GALAXY

We are now beginning the second phase of the project.

Our preliminary research suggested the need for private spaces and communal spaces. The possibilities inherent in the idea of a sim-on-a-stick suggest an innovative solution. Each user will have their own, completely private, pocket world which will serve as a three-dimensional diary, a brain gym a practice space and a playground. Each configuration will also have a shared social world that will be housed on a conventional server. Each pocket world will be able to create a teleportation link to the shared social world, but only for its owner.

Person A will be able to travel from their pocket world to the shared social world. Person B will be able to do the same from their pocket world. In the social world they can interact and pursue tasks together. They can each take items back from the shared world to their private homes, but they cannot take other people back. Person B will never see Person A's world and vice versa.

Importantly, we intend that all of the pocket worlds will be topographically identical to each other and to the social world. They will, in game terms, be different levels of the same world. This means that whatever a user learns in private is knowledge that can be shared socially- It also means that teleporting from one world to another will involve moving from a place in one world to the same place in a subtly different version of the same world.

The social world will itself be comprised of several different levels or parallel versions. This offers powerful educational opportunities since the differences can be designed to illustrate historical differences (one world is set in the eighteenth century, another in the stone-age, and so on); differences of consequence; or logical differences that need to be identified by teams of users and rectified.

Memory palaces

Each pocket world will act as a memory palace for its user. There will be outside spaces where photographic exhibitions can be created, and the process for doing that will be simple enough for a ten year old to manage unaided.

The idea of a memory palace is a powerful one that, historically, has been used for many purposes.

It can be related to the idea of commonplace books which were kept from the sixteenth to the nineteenth century. These were scrapbooks that were usually read back when the book was finished. The most important entries would then become the first items copied into a new, blank book. The effects of this are to cause the user to reimagine her own view of herself at regular intervals throughout her life.

This meditative process is ideally suited to being reimagined as a virtual space in which objects and images can be reconfigured into exhibitions at regular periods. There is much work to be done in this area, and this project will only take a few initial steps. It will enable us to see what happens when the users are able to configure aspects of their life, to arrange them, and then to rearrange them at will.

To this end each pocket world will contain building tools for users to create objects from clothes to buildings. They will be able to extend or reconfigure their personal spaces. Additionally, there will be ranges of ready-made items that users can find by exploring or by completing quests or tasks.

The decision to have ready-made items as well as building tools is the result of preliminary research carried out last year. We discovered that children seemed to divide the world into three planes. Furthest away from them was the environment itself which they took no notice of unless it was anomalous. Closest to them was their avatar which they wanted to look realistic (or at least professionally made) from the very beginning. In the middle ground was the space in which they could move, where they wanted to build, explore and play. They wanted their avatar and the world-in-the-background to

"be there", while they wanted to be able to make the middle ground themselves.

The pocket world will be seeded with objects to find, as well as self-explanatory building materials.

It will thus be able to be used to rehearse skills before using them in public. Experience with Second Life shows that many adults benefit greatly from being able to move back and forth between public and private spaces while experimenting and learning in a virtual space. Our research last year suggested that this applies even more to younger children.

Each pocket world will have three "levels". The existence of the second and third levels will only be revealed after several pre-defined gals have been achieved. Achieving these goals will necessarily be individual but information about how to achieve the tasks can be shared socially.

The pocket worlds have a built-in web browser that will be set to a Curatr account to which all the users belong. This will act as a bridge between the public and private worlds, as well as providing a venue in which users can log their achievements, ask questions and share information. Most activity in the social world will be synchronous, but Curatr will enable us to offer an asynchronous channel that ties directly into the overall framework.

The pocket worlds do not have to be run from a USB stick. They can in practice be copied onto any desktop computer and run from there. They can also be backed up onto home computers. However, from our conversations and interviews, we believe that the USB stick offers certain powerful advantages to the intended users.

Firstly it provides a physical component for the child to carry between school and home. The personal world is not, then, just something that lives on the web: it has a tangible existence. Research has suggested that this matters to many children. Secondly, it becomes the child's own possession, rather than something they can access from the family computer. This has also proved to be important. Thirdly, because the USB stick contains all the program files, the world can be run on many computers at school and in libraries that will not allow users to install files.

2D and 3D

The world will function as a memory palace, a storehouse capable of housing items of personal significance. It will not easily act as a more conventional documentation tool. It is already clear that the children interviewed distinguish between what they do inside the world and what they do when they are thinking or writing about the world. For this it appears to be better that they step out of the world to reflect upon it.

We had discovered Curatr in the early part of 2011 and in June we therefore held discussions with Ben Betts at HT2 about incorporating aspects of Curatr into the project. Curatr offers a completely gamified web-based learning management system, and the

viewer we are using for Snowcastle Valley has an in-world browser. Our current thinking suggests that quests carried out in the social world could be logged in Curatr, and tasks carried out in Curatr could be rewarded in-world.

PHASE 3: A TOOLKIT

Once we have established a virtual galaxy that works, in the sense that it provides a stimulating online environment that its members genuinely like, in a way that can be maintained and developed by the adults involved, then we will document the process. We will then have a fully operational galaxy that will serve as a working laboratory within which we can attempt to create a more generalised toolkit that can be packaged and distributed as a specific configuration of OpenSim.

In this phase we will work to encourage the wider adoption of the idea, by extending the ideas behind Snowcastle Valley to other networks.

Our initial goal is to provide an open-source blueprint for a pocket world for young children that works for them on their own terms, and at the same time has profound pedagogical benefits. Our final goal is more ambitious. We intend to develop a virtual space which can serve as an arena for contemplation and meditation, for self-analysis and self-growth, as well as providing private play and plug-in sociality.

The aspects of collaborative creation: a new approach for networked learning

Eeva Meltio

INTRODUCTION

In social media the traditional models of authorship are in a constant process of reformation and redefinition. In the era of the world wide web and computer-generated contents the authors and artists are not working alone ; instead they are sharing knowledge and actively creating new connections and communities. These new forms of collaboration have resulted in innovations like Wikipedia and open-source applications, where community creates something new that it would not be able to create without the power of masses.

Also in crowdsourced art and collaborative storytelling the participants contribute to the creation of new instead of sharing something they already know; an approach which according to Yongcheng Gan and Zhiting Zhu is the greatest challenge of education in the knowledge society. The question is no more how to help the learners to acquire a defined set of knowledge and skills, but to help them to learn how to manage, work creatively with ideas and to contribute to the creation of new knowledge. Ideas, theories and hypothesis are to be scrutinized, improved and put into new use. (Gan and Zhu 2007: 1.)

In this paper I explore the collaborative, creative processes which have emerged in online environments during the last few years in connection with experimental performance events, Happenings, and other forms of participatory art. I explore various project examples which aim to create constantly evolving digital artworks. I also explore projects, which use new technologies and methods for collaborative story creation; the process of creating stories requires decision-making models, which are particularly interesting when considering participatory working practices. Based on those observations I present some prevalent aspects of online collaborations which can be adapted in pedagogical and artistic processes.

EXPERIMENTS IN COLLABORATIVE AUTHORSHIP

The notion of a self-sufficient author has a strong effect on our perception of art and art-making; in this conception the imaginative power of an artist is highly valued and the process of art-making is regarded as an enigmatic act of creation. This romanticized view, evolved in 18th century, is still strongly affecting our perception of authors and art. It has led to a juxtaposition of the ones possessing the rare quality of being an artist and the rest

of the community, whose role is mainly to be a spectator of the outcomes.

During the 20th century this notion has been highly questioned. Already in the early 1920's, there was a tendency to decipher the dominant conception of solitary, genius authorship. Avantgarde artists in Dada were inspired by the radical political context of the time but also by psychological thinkers like Freud and Jung, whose writings became available (Govan, Nicholson & Normington 2009: 30). The relationship between art and everyday life became subject to radical scrutiny. Sceptical of the ways in which the high arts, especially visual arts, had been made rare by the capitalist markets, Dadaist artists sought to make "anti-art" or "anti-performance" that would bring out their dissatisfaction of the art market. One of the most famous Dadaist is Marcel Duchamp and his concept of "ready-made art", whereby he reframed everyday objects and brought them into galleries and other traditional art institutions (Govan, Nicholson & Normington 2009: 19).

A new experimental avant-garde group Fluxus emerged in the 50's. In the group the autonomy of an artist was highly questioned. The group was loosely organized and its members stepped in and out of the group whenever they felt like creating Fluxus works; the creative activity was based on networks of creative support. The construction of the artist's education and identity was deeply rooted in the life skills of friendship, mentoring, collaboration and play. (Taylor 2008: 167, 172.) The artists often worked anonymously, together in projects, influencing each other and in that way overruling the sanctity of the author. The group aimed for anti-structures, sought alternatives for commercial gallery system and, like Dada, wanted to demolish the separation of art and everyday life.

With their explorations Dada and Fluxus artists aimed to release imagination and the unconscious mind of individuals, who were considered as repressed and alienated because of socio-normative expectations. Especially transforming art into performing actions was a ground-breaking format which was used as a laboratory for trying new practices. The approaches they experimented with opened new possibilities for participatory and collaborative approaches that are predecessors of contemporary communication culture emerging in social media. Especially two aspects of avantgarde innovation, which are central in the context of collaborative creation, are explored in the following chapters: The use of chance and a newly configured relationship between the artists and the audience.

THE USE OF CHANCE

Fluxus artists believed in freeing the imagination and releasing the unconscious through spontaneous actions, which would be both personally liberating and socially advantageous. An individual should develop his sensitivity towards time and space in performing actions, that would rely on the element of chance and "the accidental". That meant for example juxtaposing materials, and "prompting new and unexpected meanings to arise from unusual relationships". (Heddon and Milling 2006: 64–65.)

For an experimental composer John Cage the chance became an important component of the performance practices. Cage used the principle of chance throughout his work: he

found music in his immediate environment and was interested in noise and atypical sources of sounds during his entire career (Govan, Nicholson & Normington 2009: 24). Cage's work had a strong influence on the formation and principles of Fluxus. In his experimental composition courses Cage encouraged participants to experiment with elements of chance and non-intentional action. (Higgins 2002: 2.)

The use of chance was a central element also in performance events called Happening that have taken place since the 50's. Happening refers to a loosely connected array of various live performance events, which were not arranged according to any principles of plot, narrative or character; instead, all the elements, such as the performer, objects, time, place and time, were seen as equal (Heddon & Milling 2006: 64). The form of an event was not imposed upon the materials as an external structuring principle but it emerged from what materials could do.

One of the performance techniques used in Happenings is called Event Score, where everyday actions are framed as minimalistic performances, or occasionally as imagery. One of the most famous (and first) was George Brecht's Drip music performance, where a source of dripping water and empty vessel are arranged to let the water fall into the vessel. Brecht also used musical instruments, like tubas and horns, to conduct music in his performances. (Higgins 2002: 2.) Event Scores are used by virtually every Flux artist with varying degree of success. A Fluxus performance artist Alison Knowles has experimented with Event Scores and the element of chance. One of her performances is called Piece for Any Number of Vocalists, where each participant thinks of a song beforehand, and on a signal of the conductor, sings it through[1]. The performance is formed by the "accidental" choices and individual qualities of the participants, which cannot be predicted or repeated as such.

Alison Knowles was also one of the first artists experimenting with chance and computers. In association with James Tennay, she created a computer-generated poem called House of Dust in 1967. She created a structure of variables which were then randomly generated into a poem with Fortran programming language. This raises questions of authorship: who is the author of the poem, is it the programmer who created the software or is it the writer of the individual variables used as material in generating the poem? Computer-generated poetry can again be seen as a form of more collaborative mode of authorship, something a single author cannot be given credit for.

RELATIONSHIP BETWEEN THE ARTISTS AND THE AUDIENCE

In his own work, Cage implied that the activity of spectatorship is as important and creative as the practice of making art. With his compositions like 4"33, which actually is an instruction for a performer not to play the instrument during the performance, he follows Duchamp's notion, that the audience's perception, not the artist, is the active component in making the work of art.

Allan Kaprow, who also attended Cage's classes, was inspired by spontaneous and interactive qualities of Cage's work and wanted to develop them further. Kaprow aimed for total

1 http://www.aknowles.com/eventscore.html

audience participation and wanted to leave out the spectators, who wouldn't actively take part. Kaprow developed events which were intended only for performers; there was no place for spectatorship in Kaprow's performances. In Calling he asked participants to wait at the street corners of New York to be incorporated into the event. The only way to experience it was to participate actively into event by following Kaprows instructions.

Kaprow's Happenings were carefully planned events with detailed scripts. Kaprow wrote about these arrangements: "I think it is a sign of mutual respect that all persons involved with a Happening be willing and committed participants who have a clear idea what they are to do". (Kaprow 2006: 103) Kaprow found it would be futile to assemble people unprepared to an event and say that they are "participating" when apples are thrown at them. The response of such audience is half-hearted or even reluctant.

Kaprow's approach differed from that of Cage, who considered happenings as theatrical events that have a minimal script and no plot. On the other hand, despite of Kaprow's planning and briefings that were given to participants, the actual profile of the event was not formed before the event actually took place; there was always place for the encounter of chance to shape the final work. The unpredicted elements in environment, such as traffic and weather, shape the duration and nature of the events, as do the individual participants with their way of acting in the situation. The Happening performance is always different because the final form is dependent on the action of the spectators, or as seen by Kaprow, the performers.

REMEDIATIONS

The experimental approaches of avant-garde groups have also strongly influenced the collaborative communication practices used in digital environments. The principle of redefining, or eliminating, the boundary between a performer and a spectator is nowadays an essential part of the online media culture. Jay David Bolter and Richard Grusin have discussed the phenomenon in their book Remediation. Understanding New Media (2000): "It is easy to see that the hypermedia applications are always explicit acts of remediation: they import earlier media into digital space in order to critique and refashion them".

When remediating participatory activity of Happenings into online collaborations, the earlier forms of participation are applied but also reformed, or remediated, by the characteristics of the new media. The open, web-like networks which were preferred by Fluxus-artists are a typical form of online collaboration, but at the same time they are constructed in a way which is characteristic to a medium at hand. One of the characteristics is that unlike in the physical world, the social networks are made visible by digital applications. In the social media the interactions, comments and opinions are often saved and archived which makes it possible to observe the connections and activity between the participants even after the actual event has occurred; the momentary characteristic of Happening is thus transformed into observable actions. Also the element of chance is reformed into complex computer algorithms which respond to the user activity and generate content based on what there is available in

the database.

CROWDSOURCED ART

The idea behind Happenings, such as the use of chance and framing the everyday into art works, is actively used in online art projects. Allan Kaprow's notion of guided participatory events, where performers are given instructions on what to do in Happenings, was harnessed in an online collaborative project Learning to Love You more[2] established by Mirand July and Harrell Fletcher on 2002. In the project, the participants accepted the assignments which were given in a website, completed them by following the instructions and sent the report of their work back to the community. According to the description in the community website, the "assignments were intended to guide people towards their own experience"; a goal which was also strongly affecting John Cage's pedagogical approach.

Some of the assignments were aimed to frame everyday life as art objects in the spirit of Duchamp and his readymades, such as in assignment 58: "Record the sound that is keeping you awake". Other assignments aimed to re-find the objects which we are already used to, such as assignment 43: "Make an exhibition of the art in your parents' house". Others encouraged to further audience participation: "Make a neighborhood field recording" (assignment number 2). The assignments of Learning to love you more had a close resemblance with Event Scores first conducted by George Brecht; in Event Scores everyday actions were framed as minimalistic performances or imagery (Higgins 2002: 2). The results, or reports, of the assignments were published collectively in the website. During the eight years that the project was active, there were 70 assignments and more than 8000 people participating in the project.

Learning to Love you more is an example of an online art project that used crowdsourcing to generate artworks. The term crowdsourcing means a situation where a task or a specific problem is outsourced to an undefined group of people or a community. Crowdsourced art is used in a variety of online art collaborations; for example in Swarm Sketch[3], which is an online tool for collective sketching. All the collectively produced pictures are archived into a website to an online gallery; it's also possible for a user to see the animated presentation of the picture creation line by line. The developer Peter Edmunds writes in the website that the project "explores the possibilities of distributed design by the masses" and the sketching is a product of collective consciousness. On the contrary to Learning to love you more, which represents the submissions or reports of participants in one website, in Swarm Sketch a single outcome is created by the crowd. Therefore it's important that Edmunds has added a collaborative decision-making, voting, in the tool; the participants can contribute their own line, but also influence democratically into the final form of the picture. This makes the majority's opinion visible and comprehensible at one look. In Swarm Sketch, the elements of chance, participation and decentralized hierarchy are executed in the spirit of Happening and avant-garde.

2 http://www.learningtoloveyoumore.com/
3 http://swarmsketch.com/

The Johnny Cash Project[4] and the Sheep Market[5] are examples of purely visual-based crowdsourcing art projects. In the Johnny Cash Project anyone can contribute to the creation of a music video for Johnny Cash's last studio recording "Ain't no Grave". A participant can choose a single frame for reference image and use the custom drawing tool of the site to create one illustrated frame for the video. When strung together and played in sequence over the song, the drawings create an animated music video. In the Sheep Market project, implemented by Aaron Koblin, Amazon's Mechanical Turk -marketplace workers were asked to draw a "sheep facing left" and in return they got paid 0,02 dollars. The collection of 10 000 sheep is exhibited on the project's website, where it's possible to watch an animation of how the sheep were drawn, and to buy a sheep for the price of 0,02 dollars. In his thesis The Sheep Market: Two Cents Worth (2006) Koblin writes how he wanted to "cast a light on the human role of creativity expressed by workers in the system." He also writes how easily one could command the actions of thousands of individuals to do just about anything for a low price.

STORYTELLING IN COLLABORATIVE CREATION

Storytelling in online environments has emerged as a format of crowdsourced art. A story can be described as a perceived sequence of non-randomly connected events, which can be personal, owned by a group, or invented by writers and therefore given a status of fiction (Govan, Nicholson & Normington 2007: 55). As discussed earlier, the hierarchy and the form of collaboration is defined by the fact whether the outcome is a collection or a collaboration (cf. Malone, Laubacher & Dellarocas 2009: 16). When the project is set to create a collection of contributions sent by participants, leaders or experts, the task is to select the contributions and structure the story.

The participatory modes developed in Happenings were not connected with storytelling or creating narrative structures. On the contrary, they aimed at anti-structures and anti-plots in order to create an immediate experience. Improvisation and experience are also important elements in storytelling, but creating stories based on collective problem solving constantly raises new questions concerning aspects like form, content and audience (Oddey 1994: 53). Oddey's notion is related with the concept of collective intelligence, which is defined as the ability of a group to solve more problems than its individual members; the idea is that a group of individuals may be smart in a way that none of its members is (Heylighen 1999: 1).

some of the theatre practitioners realized the potential of new hybrid and performative forms discovered by Happening artists

The question how to create and structure the story collaboratively was explored by some of the theatre practitioners, who realized the potential of new hybrid and performative forms discovered by Happening artists. One of them was Ken Dewey, who had a background in theatre, but was also involved in Fluxus. Dewey started to experiment with collaborative, democratic forms in theatre-making which led him towards a new approach, currently known

4 http://www.thejohnnycashproject.com/
5 http://www.thesheepmarket.com/

as devising or devised theatre. (Heddon & Milling 2006: 70.) Dewey's aspirations were very similar to the ones of Fluxus artists', who strived for democracy and non-hierarchy. By applying those principles in the theatre he challenged the hierarchical structures and obsolete traditions at the time.

Devising as its current form refers to a vast collection of working practices such as improvisation or associative rehearsals. Most often devising is perceived as theatre-making where a stage play or a performance is produced within a group during rehearsals without predetermined script, which means that in the core of devising is the creative process. The process relies on collaborative problem-solving, where ideas are explored through practical work, discussion, criticism and revision (Oddey 1994: 52–53). The process is successful when the colliding of ideas and individual qualities of the participants produce fresh and innovative creations. On the other hand, such a process may easily escalate out of proportions.

The devising principle of collaborative storytelling is experimented various online projects. In the Stainboy[6] -project director and scriptwriter Tim Burton wanted to explore how The Exquisite Corpse -game played by Surrealists is applied online. Burton created the first line for the story in Twitter and asked people to continue it by sending their own suggestions. Burton chose the tweets which would continue the story and posted them on the project's website. He unfolded the whole story after the last selected tweet. People participated by sending altogether over 800 tweets, and 88 of them were selected to the story. The experiment started on November 22nd 2010 and the story was finished on 6th of December 2010.

The same technology and decision-making model was used in Tweettaakirja.fi, which was a project for collective writing initiated by a group of entrepreneurship students in Tampere. A story was started by a professional writer, who wrote the first line in Twitter. People willing to participate could send their suggestions as tweets of how the story should continue. The writer chose over 1000 tweets to the final book and he also wrote the last chapter with several endings. The story was printed, and the book was published in Mindtrek-festival 2010 in Tampere.

Both of these crowdsourced writing processes applied a hierarchical decision model with a firm leadership. Professional writers initiated the projects and although anyone could send their suggestions, only some were selected when the story was created, which gave the project some elements of competition. On the other hand, all the participants were given credit in both of the experiments, even if their suggestions were not selected. There were no writing assignments or pedagogical guidance in the projects; instead they relied on the creative power of the crowd and the expert who eventually did the selection and compilation of the story.

The devising principle of collaborative creation is also applied in online processes. Opera by You is a collaboration, wherein anybody can participate by scriptwriting, composing, directing, staging and dressing an opera for Savonlinna Opera Festival 2012. The collaboration takes place in wreckamovie.com, which is an online collaborative film community. The process is guided by opera professionals and proceeds by giving out assignments in the same

6 http://burtonstory.com/

manner than in Learning to love you more except that the assignments are structured to bring forward the continuous planning process. The assignments are often designing or composing tasks, participants are for example asked to visualize the Earth in the year 2012. The task was first initiated by a visual stage designer; he also comments the posts in terms of how usable the suggestion is or by asking questions. Participants also upload pictures and moving images to present their ideas on how the stage should look like.

Another online devising process was initiated by the Helsinki City Theatre in 2009. In their project a group of young people was asked to write a performance. The outcome was a script, Free Hugs, which was performed in August 2010. In contrast with other processes presented here, the collaboration happened in a defined group, which was assembled and closed before the actual writing started. A group of 14 people, between the ages of 16-25, were selected to the project. The writing itself took place in a closed web environment and in three face-to-face meetings. The writing process took 10 weeks. It was based on assignments given by a professional writer, who also commented the writings and initiated the discussion when necessary. The process resembled an online course or workshop in contrast with open, web-like processes described earlier in this chapter.

PEDAGOGICAL IMPLICATIONS

The experimental projects described in this paper indicate the transformation from knowledge building to collective ideation and collective knowledge. Therefore the main challenge in pedagogy is to find creative modes for working in different fields and also to enable and inspire people to contribute to creation of new knowledge (Gan and Zhu 2007). Based on the exploration of the past and existing participatory projects, I find the following aspects essential when considering the participatory art projects:

- Crowd: is the group open or closed: who can participate?
- Structure: how does the process start and proceed?
- The amount of participation: how many times is it possible to participate?
- The outcome: is the outcome a collective or a collaborative work?
- Decision-making: are the decisions made by individuals, crowds, experts or is it a mixture of all of these?

These aspects are explored in detail in the following chapters:

Crowd: is the group open or closed: who can participate? Almost all the projects were open for anyone to participate when the project was active. The participation may have required registration into a service, such as Twitter, but registration is possible for any web user.

Structure: how does the process start and proceed? The examples presented here have various structures: they can based on a single assignment, like was the case in Sheep market and the Johnny Cash project, or a series of assignments which are not directly connected with each other, like in Learning to love you more. The projects Opera by you

and Free Hugs are structured as a series of assignments which are built upon each other.

The amount of participation: how many times is it possible to participate? In Swarm-Sketch the participant can draw only one line, which is indicated when a participant tries to draw another line after finishing one. In other projects the amount of participation is not limited. In fact many assignments in Learning to love you more got several reports.

The outcome: is the outcome a collective or a collaborative work? When creating a collection, all the contributions become part of the artwork and are presented as equal contributions; this was the case in Sheep Market and Learning to love you more. When the aim is to create a collaborative work of art, such as a performance, book or story, the outcome requires selection and pruning, which significantly changes the nature of collaboration. The outcome can also be a mixture of a collection and collaborative works: in the Johnny Cash Project it is possible to watch several music videos which have been generated from the material, but also a collection of individual frames is available.

Decision-making: are the decisions made by individuals, crowds, experts or is it a mixture of all of these? When the project aims to create a collection, the decisions are made by individuals: whether to contribute and with what kind of input. In projects like The Burton story and tweettaakirja.fi, the decision of what is selected and in which order is made by an expert. The more the crowd is allowed to make decisions, the more the outcome reflects the crowd's collective perspective. On the other hand, the collective decision-making may lead to such uneven results that they no longer seem interesting to neither the participants nor the audience. The mode of decision-making also affects the amount and level of communication. In projects where decision-making was hierarchical, discussion or even space for communication was not included in the website. On the other hand, Opera by You and Free Hugs were based on the idea that collaborative ideation promotes the process; therefore online discussion and commenting were active in both examples.

The mode of decision-making also affects the amount and level of communication. In projects where decision-making was hierarchical, discussion or even space for communication was not included in the website. For example in Stainboy or tweettaakirja.fi the crowd offered their suggestions but did not discuss them, and the selection was made by expert writers. In projects which aimed to create a collection, such as Learning to love you more or Sheep market the decision to publish all the contributions was made hierarchically. In Learning to love you more the artists who initiated the project rejected only few contributions, but that decision was not discussed within the community. On the other hand, Opera by You and Free Hugs were based on the idea that collaborative ideation promotes the process; therefore discussion and commenting were active in both examples.

	Crowd	Structure	Amount of participation	Outcome	Decision-making
Learning to love you more	Anybody	Assignments	Unlimited	Collection	Individual
Swarm Skecth	Anybody	One task	One time per image / vote	Collaboration Collection	Individual
Johnny Cash Project	Anybody	One task	Unlimited	Collaboration Collection	Individual Crowd Expert
Sheep Market	Anybody	One task	Unlimited	Collection	Individual
Stainboy	Anybody	Contribution	Unlimited	Collaboration	Expert
Tweettaakirja.fi	Anybody	Contribution	Unlimited	Collaboration	Expert
Opera by You	Anybody	Process	Unlimited	Collaboration	Crowd Expert
Free Hugs	Selected group	Process	Unlimited	Collaboration	Crowd Expert

Table 1: Aspects of participation

Considering these aspects makes it possible to understand the variety of collaboration explored by these projects. The status of the initiator of the project is an important factor when considering the motivation for participation. For example in Stainboy and the Johnny Cash project the chance to work in collaboration with the rewarded directors and scriptwriters Tim Burton and Chris Milk was appealing, although the mode of collaboration was quite limited.

When considered in a pedagogical context, the challenge is to create a framework for collaboration that inspires people to participate, share, discuss and generate ideas. The quality of the tasks or assignments is crucial. By quality I mean two characteristics: how inspiring the task is and how challenging it is to complete it. In some of the projects, such as Sheep Market, the task was very simple: to draw a sheep facing left. In some cases the task was completed in a few seconds. In Learning to love you more the assignments were in general more challenging, but not in terms of technical or artistic skills. For example in the case of the assignment #31: ”Spend time with a dying person” requires contemplation and daring from the participants to reveal their thoughts. The challenge also made participants to commit to the project: some of the participants followed the project for several years and contributed on assignments of their choice.

CONCLUSIONS

During the 20th century there has been a constant tendency to scrutinize and redefine the authorship and find new collaborative forms of art-making. In digital space these forms are now emerging in ambiguous interpretations; the technology allows new visual and conceptual modes of sharing ideas and knowledge, which may evolve in unpredictable results.

These crowdsourced projects mean significant changes in creative field and social structures. When art community is based on the idea of what you do instead of who you know, it opens new possibilities for anyone who has a laptop and an internet connection. This means that works of new artists, who have no education or relevant connections, may bring out their work on equal terms with established artists.

This also leads to a constant redefinition of the role of a teacher. An acquired set of skills is not the ground for teaching anymore. A teacher has to be able to create and enhance inspiring frameworks for crowds to create, share and scrutinize ideas instead of mediating established knowledge. Considering on projects explored in this paper, the practices based on experience, use of chance and immediate participation are relevant approaches to experiment with.

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The making of a maker-space for open innovation, knowledge sharing, and peer-to-peer learning

Elisabet M. Nilsson

ABSTRACT

This short paper presents the initial steps in the establishment of Fabriken (the Factory) which is an open maker-space, and lab space for creating and experimenting with technologies. The space also provides a platform for peer-to-peer learning, and networked learning that goes on beyond the physical walls of the lab space. From a research perspective the development of Fabriken is a research intervention exploring how platforms for learning and innovation can be co-designed, and established in collaboration with the users. The aim of this paper is to present strategies behind this co-design process. To position Fabriken in a societal and cultural context some words are also said about the theoretical assumptions guiding this work, that is, socio-cultural theories on human action and learning.

Keywords: maker-space, open lab, peer-to-peer learning, co-design, socio-cultural theories, social and technological innovation, co-production

INTRODUCTION

This short paper presents the initial steps in the establishment of living lab Fabriken (the Factory), located in a cultural space/house that is run by a non-profit organisation, and owned by the municipal. Fabriken is an open maker-space where citizens, companies, public institutions, researchers, NGO's get access to tools, technologies, knowledge and skills in order to experiment with, and prototype ideas, products and services. In return the users provide input to the lab by sharing their ideas, knowledge, skills, and experiences. The basic concept behind Fabriken builds upon the belief that democratic access to technology fosters and supports grassroots initiatives, open and participatory innovation and co-production [4]. Besides being a lab space for creating and experimenting with technologies, Fabriken also provides a platform for peer-to-peer learning, and networked learning that goes on beyond the physical walls of the lab space.

From a research perspective the development of Fabriken is a research intervention exploring how platforms for learning and innovation can be co-designed, and established in collaboration with the users. The aim of this paper is to present strategies behind this co-design process. To position Fabriken in a societal and cultural context some words are also said about the theoretical assumptions guiding this work, that is, socio-cultural theo-

ries on human action and learning, see e.g. [5][7]|8][9]. The lab was launched only a few months ago (April 1, 2011). During this short period of time studies have been initiated, but are yet not completed. More elaborated reflections, and profound analyses will be presented in forthcoming papers. Also, individual learning actions occurring at Fabriken are not specifically discussed in this paper, but will be treated in future work.

NEW TECHNOLOGIES, TOOLS AND LEARNING

Before going into presenting the process of establishing Fabriken, some basic assumptions within socio-cultural theories on learning in relation to new technologies and tools are briefly presented in order to set the scene.

The question of how the emergence of new technologies and tools change our world is certainly not only related to material advances and technological innovation. There is also a sense in which technologies changes the way humans perceive and act upon the world. This refers to social change, and how we on an intellectual level respond to the possibilities that new tools bring along. Socio-cultural learning theories view the usage of tools as a fundamental part of all human action and development [6]|7][9]. Tools are regarded as active and not passive objects, since they influence how we think, act, and behave. They enable us to do, experience, and learn things that we cannot achieve without them [5].

In other words, new tools enable new kinds of actions. When watching a person solving almost any kind of problem, from navigating through the streets of a city to how to bake a cake, various tools are being applied that the thinking is supported and influenced by. “Higher mental functioning and human action in general are mediated by tools (or ’technical tools’) and signs (or ‘psychological tools)” [6] (p. 28), and processes like remembering, problem solving, or being creative, are tightly connected to the tools applied.

Thus, in order to understand what characterise human action, learning and development the tools utilised have to be taken in consideration since they are intertwined with the mental process that is taking place [5][7]. This claim can be illustrated by using a very simple example, the calculator. By having access to such a tool, and knowing how to use it we obviously can solve much more complex mathematical problems than without it. Using the tool probably also has an influence on our skills in mental arithmetic since that competence is not needed anymore, and therefore not being trained. Other examples of tools, such as books, databases, apps, shared digital photo albums, mobile broadcasting services, or other similar external memory systems [5] change how information and knowledge are codified, stored, and transferred. What kind of tools that is used change over time, and is connected to the introduction of new technologies [1]. These, maybe seemly banal examples, exemplify how usage of everyday tools influence the way we think and act, and generate new patterns of behaviour, and actions.

From a Fabriken point of view these theoretical viewpoints result in two important conclusions. Firstly, from a democratic point of view it is of great importance that citizens from all kinds of socio-economic backgrounds get access to new technologies and tools

in order to get equal chance to learn, and develop skills and competences. Secondly, to put new technologies and tools in the hands of people result in new thinking, learning, and acting which support the process of social and technological innovation. The overall vision of Fabriken is therefore to offer an open lab place where different user groups from different background get access to advanced technologies and tools that otherwise would not be available to them. This will not only offer new learning opportunities and support exploration, but also result in solutions that would not have been possible without the tool. By being an open lab space, welcoming all kinds of users Fabriken also serves as a meeting platform that connects different user groups, resources and facilitates co-production initiatives.

STRATEGIES FOR CO-DESIGNING FABRIKEN

Based on the viewpoints brought forward above, "inclusion" is a core value in all activities taking place at Fabriken. Besides offering open access to the lab space, this also includes that users are involved in designing the lab space itself. Instead of offering a "ready-made" lab the infrastructure behind Fabriken is co-designed together with users in an on-going, dynamic process.

Up to now, this work has in principal consisted of two parts:

A) Infrastructuring – building the physical lab space, purchasing tools and equipment, setting up booking systems, digital calendar etc.,

B) Community-building – informing, inviting, engaging users from different backgrounds with a wide range of interest and intentions.

In connection to the inauguration of the (initially almost empty) lab space, the infrastructuring and the community-building activities were kick-started by the research team through a series of workshops, and interventions. Through this process needs and requirements in terms of equipment, technologies, skills and resources concretely became visible, and articulated. Users that participated in the workshops contributed to identify necessary investments to create a pertinent maker-space that could support and facilitate their desired actions. The users were also encouraged to organise their own workshops, and projects. Their specific requirements in terms of tools and equipment were considered by the lab manager and, if feasible, purchased. Through this still on-going process the lab space infrastructure is step-by-step co-designed together with the users.

The projects completed up to now have been of various kinds in order to appeal users with various kinds of interests and intensions. Examples of projects organised so far are: 48 h Hackathon, Open lab nights, workshops on themes such as urban gardening, Arduino, CNC drilling skills, re-design of second hand clothes, handicraft techniques, cooking, toy re-make, video art. Beside this, also users have organised their own projects and activities in the lab.

To summarise, projects and interventions organised up to now have been striving

to fulfil two aims: (1) to identify users' needs and requirements in order to step-by-step co-design a relevant lab space, and (2) to attract a wide range of people with different backgrounds and interests in order to establish a multifaceted community associated to the lab, and to link back to a core value behind the Fabriken concept, that is, "inclusion".

Image 1. Pictures from various workshops organised at Fabriken.

CONCLUDING COMMENTS

The process of establishing *Fabriken* will soon enter a new phase, that is, the process of establishing an autonomous peer-to-peer learning culture, and self-organising learning environment. The research team will step by step be phased out, and the community that currently is being established will gradually take over and run the activities happening in the space.

Many of the questions that aroused in the first phase had to do with how to identify and engage the wide range of *Fabriken* users that we are aiming for. How to in ensure inclusion, and create an open space for real, not only in theory but also in practice? What we learned is that new users' engagement initially needs to be facilitated. If people do not feel comfortable in that kind of lab space they will surely not turn up, if not for a specific reason. As previously mentioned, our strategy has therefore been to organise some seemingly farfetched workshops, on themes such as baking, gardening, toy making. By creating reasons for unexpected users to enter, discover and explore the lab space, we hope that they eventually feel at ease being there, and make the space to their own. The question is how well we have succeeded in this work so far? How to govern a situation that strives for inclusion and openness? To be self-critical; what users and what interests

have we unconsciously been excluding in this subjective piece of action?

A question that also came up is the issue of how to ensure long-term engagement among the users in order to build a solid community? It turned out that many of the new users came to one, or maybe two of the workshops. Despite the fact that they seemed to have appreciated the workshops, the lab space and the growing community, they did not return. Not surprisingly, to build a community takes time, and something to take in account and plan for.

Another challenge that became obvious is how to establish a culture of knowledge sharing, where users are willing to share their skills, and spending time doing so. To be able to act on affordances offered in the space, users need to have skills to manoeuvre machines and tools provided to them in the lab. Our hypothesis before starting the project was that this knowledge would be transferred and developed in a peer-to-peer learning process. Up to now, this has to some extent also happened. Lead-users, that is, advanced users who are willing to share their knowledge with others [8] have introduced new users to the environment. However, relying on that a small numbers of lead-users should educate the rest of the community is not a sustainable solution. Possible actions to take to handle this potential future problem are either to increase the numbers of lead-users, or to develop an introductory procedure directed to all new users, and organised by the lab management.

At the moment we are processing, and analysing data gathered and experience gained in the first stage of the project. Further elaborated research results, and analyses of the co-design process and learning actions will be presented in up-coming work. Next step is also to put our results in relation to results presented by other scholars operating in the same field, e.g. [2][8][3]. A question to explore in future work is what it means to a city to provide these kinds of open maker-spaces to its citizens in a longer run? One scenario is that open maker-spaces, such as *Fabriken*, could serve as future technology classrooms by providing learning spaces where youngsters learn about technology by experimenting with and prototyping ideas, and products, and by taking part in the community.

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New immersive (panoramic) mass media: how new media channels the perception and what kinds of impacts are conceivable

Ina Arendt

ABSTRACT

Since social networks are a part of (our) daily communication routine, more and more applications are inviting the users to publish every single aspect of their lives; these invitations are more than welcome, and answered without a deeper understanding of the structure of the internet itself.

The immersive character of many of these applications is one of the major causes why people are addicted to use such environments.

It is the absorbing intensity of the medium, a belief beyond its true possibilities that makes an immersive medium as interesting as it seems to be.

The thrill of senses plays its certain role, the immersive medium acts with partly directed and on the other hand subdued perception. The user forgets for a short time that he is part of some kind of artificial, staged kind of presentation in the media; this is the moment when the immersive effect starts.

Set into a specific emotional context, the user gets entangled into the setting and believes the presented reality.

Keywords: Immersive Media, Panorama, Panopticon, Panspectron

INTRODUCTION

Today, billions of public accessible pictures are available on the web. Databases like “Flickr” and “Google Image Search” (to name only two) support an easy way to publish everybodies personal view of life. Such acquisitiveness paired with the desire to publishing, which sometimes might seem somehow exhibitionistic, leads to a major question: “What is this all about?”

Maybe the attitude is based on the handiness and user friendliness of such implementations and platforms and the *pure* possibility to use such things leading users to contribute. Or like Flickr says:

> “ The key goals of The Commons on Flickr are to firstly show you hidden treasures in the world’s public photography archives, and secondly to show how your input and knowledge can help make these collections even

> richer. You're invited to help describe the photographs you discover in The Commons on Flickr, either by adding tags or leaving comments.
>
> The program has two main objectives:
>
> - To increase access to publicly-held photography collections, and
> - To provide a way for the general public to contribute information and knowledge. (Then watch what happens when they do!)- and the possibility to share photo content with associated persons."[1]

This statement seems to be dubious, in fact the majority of viewers are complete strangers and descriptive tagging only makes search engines work more efficiently.

But what is the impressive phenomenon rising at the horizon?

Aren't these personalized mappings of the users consciousness and cognition?

- A "navel gazing" to the marrow of the users which are displayed to the outer world?

Mass media is not a new invention, merely its fundamental ideas, functions and its exposure are changing.

HISTORIC OVERVIEW OF IMMERSIVE PANORAMIC MASS MEDIA

One of the first immersive medial environments is dated around 7.000 bC at the Neolithic,

Shamans started to press their colored hands on a caves wall. They invented something radically new, something never known before. They left a message: *"Its me! Here!"*

This is a universal human code - quite simple and still understandable today. Anyone can recognize themselves and empathize the situation when these drawings where made.

This, too is the idea of immersive media. The user is invited to play in an environment and take it for real - to become part of an environment as a being in it.

The boarders between reality and fantasy are floating. The user is trapped and enchanted, fills the place of a previously invented character and gets immersed, believing to have taken the role on himself.

Each age brings it own immersive medium, playing with the viewing patterns and emotions of the recipients. Actually also a painting can unfold such an effect.

Who has ever thought the name Panorama would describe a neat nature view from an elevated spot is mistaken. Panorama is a made-up word, a terminus technicus, similar to automobile or television. The word Panorama consists of the two Greek words pan = all and hórama = vision, this new word was first mentioned in written form in 1787.2

In the year 1787 a Scottish painter, Robert Baker had ambitious and odd business ideas.

Under the name of „la nature à coup d'oeil" (view into nature) he had his 360° painting patented. The immersive impact was unbelievable.

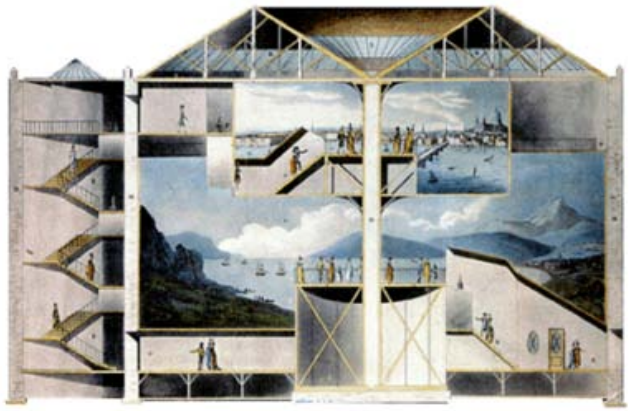
The horizon as something aesthetically delightful was a perception that started at the same time.

Centuries before, in medieval times, the majority of human population died at the same place they were born without the opportunity to experience a new horizon. In the 18th century, the intellectual human being tried to reach the horizon, they went on journeys to "broaden their horizon"; they explored places like mountaintops or the sea only to have the extraordinary encounter with the phenomenon of the unrestricted view.3

The Panorama owes its appearance to the discovery of the horizon.

The Rotunde is the ingenious interface to display the panorama.

> "The Panorama is (...) pictorial concept, „symbolic form" of a specific, bourgeoisie nature understanding of nature and world, (...) the Panorama appears as a machine in which the bourgeoisies` point of view can be learned and simultaneously glorified, an instrument of liberation and reincarceration of the view, the first optical mass medium in its strict sense."4



A mass medium was born. Its requirements have had their effects until today, a maximum authenticity in the imitation of reality. It is easy to interact with the Panorama; there are not any risks to be taken with it. See and be seen, a passive participation in an actually active process.

The concept still works. It has had its rebirth in the last few years, modern versions of the unknown and mystical places on Earth. Those are mainly places that are either too far or too dangerous to reach or places of past centuries. The environment is simulated, a huge analogue interface, completed with matching acoustic effects.

The human desire to explore far away horizons is still increasing. Today's software solutions with perfect picture in picture blending have become very popular. Implementations like

Google Earth and Google maps 3D are just the beginning. First implementations like Blaise Aguera y Arcas5 have developed during the last years. With software like PhotosynthTM or Bing with augmented reality Maps, previously unthinkable panoramic inventions in the virtual world are developed further.

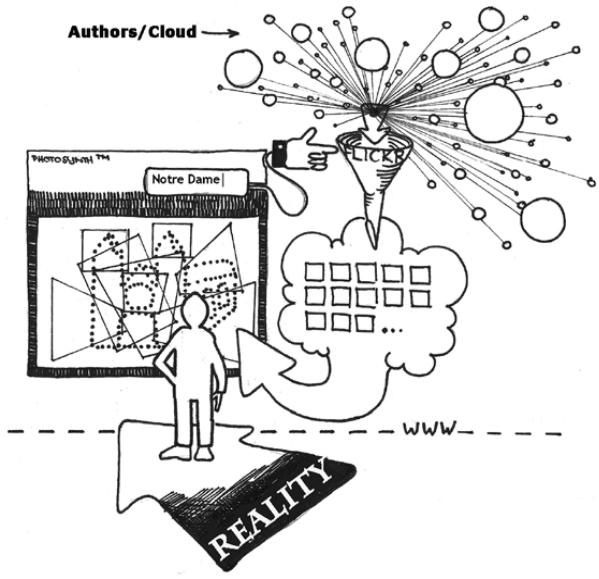
NEW ASPECTS OF PANORAMAS

An elaborated tool, the PhotosynthTM application, developed 20096, is based on the implementation of Seadragon, also an invention Arcas, is well suited to create panoramas of any kind. The software allows storage of countless photos on a computer due to advanced forms of data compression. The zoom in and out function is transition-free, but the most innovative idea in combination of these two applications is the ability of pattern recognition. The amount of stacked photos is scanned for exact matching sequences and the edges of these matching's will be blended together to a new picture. The software is able to render a 3 D model based on the provided material. Matching patterns are marked with a dot and through the multiplicity of these dots a wireframe like model can be generated. Based on this marked similarities, the stored pictures are rearranged to a new seamless panoramic landscape view or a perspectively correct model of a building.

When Arcas first presented the tool, at TED - talks7, he used a trick to gather useful pictures. He simply accessed the database of Flicker with a search entry of the "Cathedral of Notre Dame". He profits from the earlier described tagging habit of thousands of Flicker users. Within seconds he operated with countless snapshots displaying the Cathedral. He generated a virtual model of the object without ever physically being there or shooting a single photo of the object himself.

This is the exploitation of a huge and anonymous community to gather the singularly goal, to shape a multiple photographed object to one complete more-dimensional model. It conjures a new common expression without the explicit authorization due to the originated authors processing even private content. These private contents are exposed and free usable in the web; partially because creators do not even think about their traceability by tagging, or having the slightest idea about what uploading content into the web means. This material can and will be transformed at will.

The Cathedral of Notre Dame example is a simple expression how to gather information from the web. The search item "Cathedral of Notre Dame" yields a total of 1.500 000 hits on Google image search and 22.875 on Flickr. The amount compiled by Photosynth provides an unbelievably detailed image of the whole object. It's a kind of new medium that selecting available material to create something never seen before. The individual creator or the singular item is hereby completely trivially unimportant.



Cloud – sourcing is the phenomenon working with the web like in the Photosynth example. By using collected and thematically classified material on the web, the user is making use of the potential of the masses. Different opinions circulate about using these

methods.

According to various theses like “global Brain, Superorganisms”8 by Heylighen, „the Wisdom of Crowds”9 by Surowiecki etc. the specific potential of the collaborative working masses can be utilized to emerge knowledge formation in a positive way. On the contrary, scientists like Lanier advise against the degradation of the individual. He criticizes the emerging Cloud dynamic, calling it web-Maoism.

“You have to be somebody before you can share yourself”10

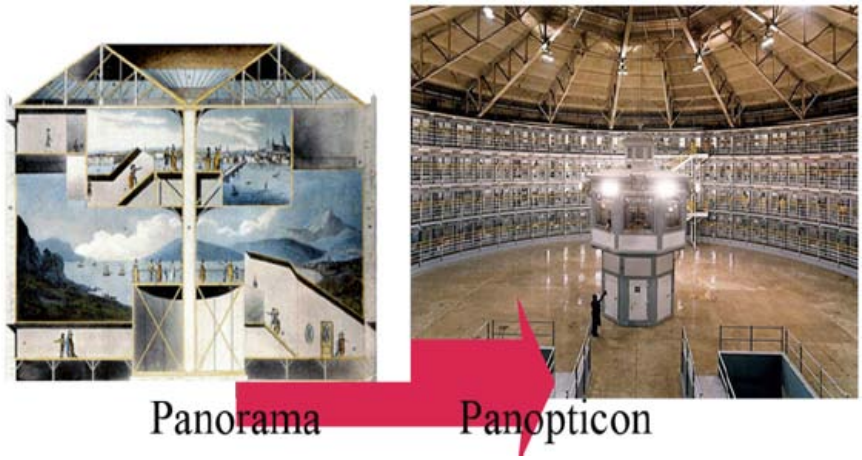
“The design of the internet evaluating information higher than individuals that provides them. The rules of the web are written by technicians they don’t give a hoot on human communication. Thereby we took the dignity of mankind.”11

SIMILARITIES

1787, the same Year Robert barker opened the panorama to the masses, Jeremy Bentham, a theoretic leader of the Utilitarianism has had the idea of an ideal universal surveying complex, “the Panopticon”. At the beginning of 19th century, the humanistic parts of society were uneasy with the idea of torture and martyrdom of convicted criminals. Like before, the main purpose of punishment was to imprison and penalize the delinquent by total and permanent surveillance. The idea was to educate the prisoner to reduce criminal energy by hindsight and formation and restructure him to be a proper worker again. The principle of the Panopticon is the same architectural model as the Rotunde. In the middle of a circular structure a tower with an all- around view is provided, it holds windows, opaque for the convict. The observer has the possibility of surveying the imprisoned at any time without being seen. The ring-like structure of the prisoner’s tract is separated into similar spaces with two windows, one at the exterior and one at the interior side, illuminated by daylight. The observer can survey every move/motion and also disturbances of the convicts daily routine.

> “(…) But the Panopticon must not be understood as dream building; it is the diagram of a mechanism of power reduced to it’s ideal form; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact a figure of political technology that may be detached from any specific use. It is polyvalent in its applications; (…)”12

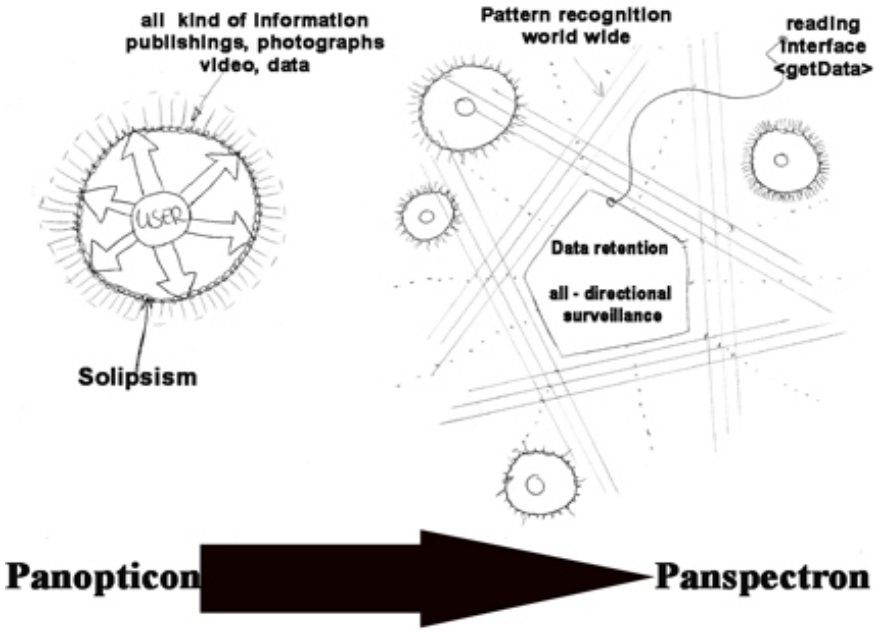
Indeed, the Panopticon is a symbol of the political power of its time.



A glance on the part of the three dimensional displaying structure of Photosynth suggests an analogy with the principles of the Panopticon. The architecture is similar to the emphasized collage in the virtual display. Thinking of the panorama within a Rotunde as a Panopticon in terms of Bentham, some differences are obvious. The surveillant is more or less a viewer, a consumer of an immersive impact while watching the landscapes on the walls.

Meanwhile the panoramic tool Photosynth, due to its connection to the web, is rather an inverted panopticon, or to follow Hookway, a part of the Panspectron. The setting of the scene happened somewhere outside, and social surveillance is possible.

> "With the transition from a panopticon to a panspectron environment, the production
>
> of open information not only provides support for communities but also contributes to surveillance."13



Several panopticons are stringed together and each other viewer also can deliver content. The own perspective view is spread into an unknown public space, a non-obvious ubiquitous surveillance. The private sphere is exposed and will be explored by an anonymous outside world. The observer is also the observed.

“Instead of positioning some human bodies around a central sensor, a multiplicity of sensors is developed around all bodies: its antenna farms, spy satellites and cable traffic intercepts feed into its computers all the information that can be gathered. This is then processed through a series of “filters” or key-word watch-lists. The Panspectron does not merely select certain bodies and certain (visual) data about them. Rather, it compiles information about all the same time, using Computers to select the segments of data relevant to its surveillance tasks.”14

The Panopticon that has abandoned its architectonical shell, similar to human behavior, it is now digital. It is not an optical medium anymore, it records to the minuscule interferences in the social structure; the Panspectron discerns patterns of discrepancy. Since the cold war was over, the military part of the government has developed pattern recognition algorithms further on and those prospects are still in use. The new enemy is unknown – everybody is suspicious.

A further difference regarding Panspectron and Panopticon is to be defined in the 4th dimension. Conviction, punishment and also data retention occur independently of time or chronological offset. The collected data can be used later if a suspicion arises. It will be reviewed, filtered, sorted, evaluated if a case is suspicious, and can be converted to

evidence. Pattern recognition is believed to enable predictions of future behavior. Social Network Analysis is an instrument to research possible dangerous contacts to terroristic or criminal groups and will also be used to predict possible future acts of crime as in “pre crime”.

With such a powerful tool like Photosyth running on personal data und traces left back in the web by everyone of us, the possibilities are infinite: thinking a bit further by adding data from Closed Circuit TV, money transactions and telephone contacts that contain data like time, place and duration.

The World Wide Web was invented from its founders as a tool of free information flow, collaborative work and free speech, as a democratic instrument, without prejudices in age, health, sex, gender and political view. It should stay like this. Every user should reclaim his personal privacy and stop the irresistible spying. To quote Manuel deLanda:

> “ When the Computer screen became the surface of contact between two machinic species, people and computers, it also became a potential trap for individuals: software hacking, as was discovered early on, is powerfully addictive. Computer screens can become “ narcotic mirrors,” trapping users by feeding them amplified images of their narcissistic selves. The same interface that can allow users to control the machine, can also give them a false and intoxicating sense of their own power. For this reason visionaries like Licklider and Engelbart, Kay and Nelson, emphasized the need to use computer networks as means for creating new forms of collective intelligence, of getting humans to interact with one another in novel ways. At every step we will find a similar mixture of new roads to explore and new dangers to avoid (...). The Pandemonium is one such road. Many more will have to be invented before this small escape routes can be made into truly liberating paths.”

(ENDNOTES)

1 http://www.flickr.com/commons/

2 cf. Chambers Encyclopedia, London, 1955, Panorama: “ein Wort, geprägt von oder für Robert Barker; 1789

3 cf.. Johann Wolfgang Goethe, italienische Reise 2. Teil, J.W. Goethe Werke (Sophienausgabe), I. Abt.,Bd. 30

4 “Das Panorama(…) bildlicher Ausdruck, „symbolische Form“ eines spezifisch modernen, bürgerlichen Natur und Weltverständnisses ist, (…) So erscheint das Panorama in einer Hinsicht als Maschine, in der die Herrschaft des bürgerlichen Blickes gelernt und zugleich verherrlicht wird, als Instrument zur Befreiung und zur erneuten Einkerkerung des Blickes, als erstes optisches Massenmedium im strengen Sinne.”

Stephan Oetterman, Das Panorama, Die Geschichte eines Massenmediums, Frankfurt am Main 1980, p.9

5 Blaise Aguera y Arcas is an architect at Microsoft Live Labs, architect of Seadragon, and the co-creator of Photosynth, a monumental piece of software capable of assembling static photos into a synergy of zoomable, navigatable spaces.

6 http://livelabs.com/

7 http://www.ted.com/talks/blaise_aguera_y_arcas_demos_Photosynth™.html

8 cf. Heylighen Francis: The Global Brain as a New Utopia, 2002

9 cf. Surowiecki James: The Wisdom of Crowds, 2004

10 Jaron Lanier, You are not a Gadget, 2010

11 Interview with J. Lanier: Spiegel Online, January 25. 2010

12 Foucault, Überwachen und Strafen, Suhrkamp, Frankfurt am Main, 1977

13 cf. Edward Vielmetti, Mitarbeiter bei International Network of Social Network Analysts and the Internet Engineering Task Force.

14 Manuel de Landa, War in the Age of intelligent Machines, Swerve Editions, New York, 1991

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http://en.wikipedia.org/wiki/Utilitarianism

Section 6
Social Spaces

Connective environmental education: augmented-reality enhanced landscapes as distributed learning ecosystems.

Salvatore Iaconesi, Luca Simeone, Cary Hendrickson, Oriana Persico

ABSTRACT

"A Third Augmented Landscape" is a performative presentation and scientific paper discussing the outcomes of a research project carried out by FakePress Publishing and Università di Roma "La Sapienza": the creation of an open source augmented reality (AR) system for leaves. This AR system, called LEAF++, is based on a combined series of computer vision techniques that allow smartphones and personal computers equipped with a webcam to recognize leaves and other parts of plants and to show educational content and interactive experiences. This possibility is used in the critical interpretation of Gilles Clément's definition of the "Third Landscape": the sum of spaces in which human being gave up to nature in the evolution of the landscape [1-2]. LEAF++ is used as a new eye on urban spaces which is able to identify the Third Landscape and turn it into a place for information, expression and interaction.

INTRODUCTION

Gilles Clément talks about the necessity of training our gaze into recognizing and understanding what he defines as the Third Landscape. "The Third Landscape – an undecided fragment of the Planetary Garden – indicates the sum of the spaces in which man gave up to nature in the evolution of the landscape. It regards urban and rural forgotten places, spaces for transit, industrial wastelands, swamps, moors, bogs, but also the sides of roads, rivers and train tracks. The whole of these forgotten places are reserves. De facto reserves are: unaccessible places, mountain tops, uncultivated places, deserts. Institutional reserves are: national parks, regional parks, «natural reserves»"[1]. Gilles Clément's notion of Planetary Garden takes into account the composite, stratified, unstable nature of urban and territorial contexts: an indeterminate, plurivocal and polycentric multiplicity where the borders between natural and artificial are continuously renegotiated. The Planetary Garden is the garden of the contemporary urban landscapes.

Our daily experience of elements coming from this Planetary Garden (green areas, fruits, plants, trees) is usually confined to a purely operational dimension. Globalization and daily routines often force human beings to recognize plants and vegetables only in terms of their use in products that are found in supermarkets, or of the trees and bushes that decorate the sides of our roads. We even lost contact with any knowledge about the seasonality, botanical characteristics and origins of the fruit and vegetables we buy

and eat. One study [3] - among many other studies of a similar scope - gave advice to farmers in remote parts of the world encouraging the production of off-season products for export and highlighted this practice as a truly effective marketing strategy based on the documented assumption that consumers want specific products all-year-round.

Stepping outside of the supermarkets, we see that plants still remain within the great unknown as regards the majority of inhabitants of urban spaces. In cities, plants populate the periphery of our world view, living a life that is mostly aesthetic and excluding practically all forms of knowledge about their origins, characteristics, benefits and roles in the ecosystem, which remain largely hidden from the majority of citizens.

We decided therefore to develop a framework for an augmented reality application that helps in trasforming the Third Landscape in an infoscape for connective environmental education. The overarching goal was not only to increase awareness, but to improve people's knowledge about the natural environments that surround our (almost-always urban) daily life.

We developed a digital platform for an augmented-reality application that allows users to retrieve and experience new orders of information on various plant species found in specific geographic regions. LEAF++ is a digital field guide combining the convenience of smart phone technology with a library of information and user-built content about plants and cultural linkages to nature. LEAF++ is connected to a CMS (Content Management System) that also allows people to connect specific multimedia content to natural physical components (e.g. user can write a textual description on the CMS and tie it to a specific leaf). The CMS works in a wiki, collaborative mode. LEAF++ functions therefore as a digital field guide for identifying and understanding the local flora but also as a connective environmental education platform to enhance the appreciation, enjoyment and study of plant life among people of all ages and to appreciate the interaction with nature.

THEORETICAL FRAMEWORK

Augmented reality allows objects that only exist within the computer to be grafted onto the physical environment. The production of material space and objects [4], [5] has been a key aspect of human activities, and in history we have repeatedly been trying to augment our immediate reality [6-8] mainly superimposing cultural layers on it (or weaving them into it).

Our project stems from a fertile research agenda and an abundant scientific literature on AR as a framework to enhance learning processes and practices.

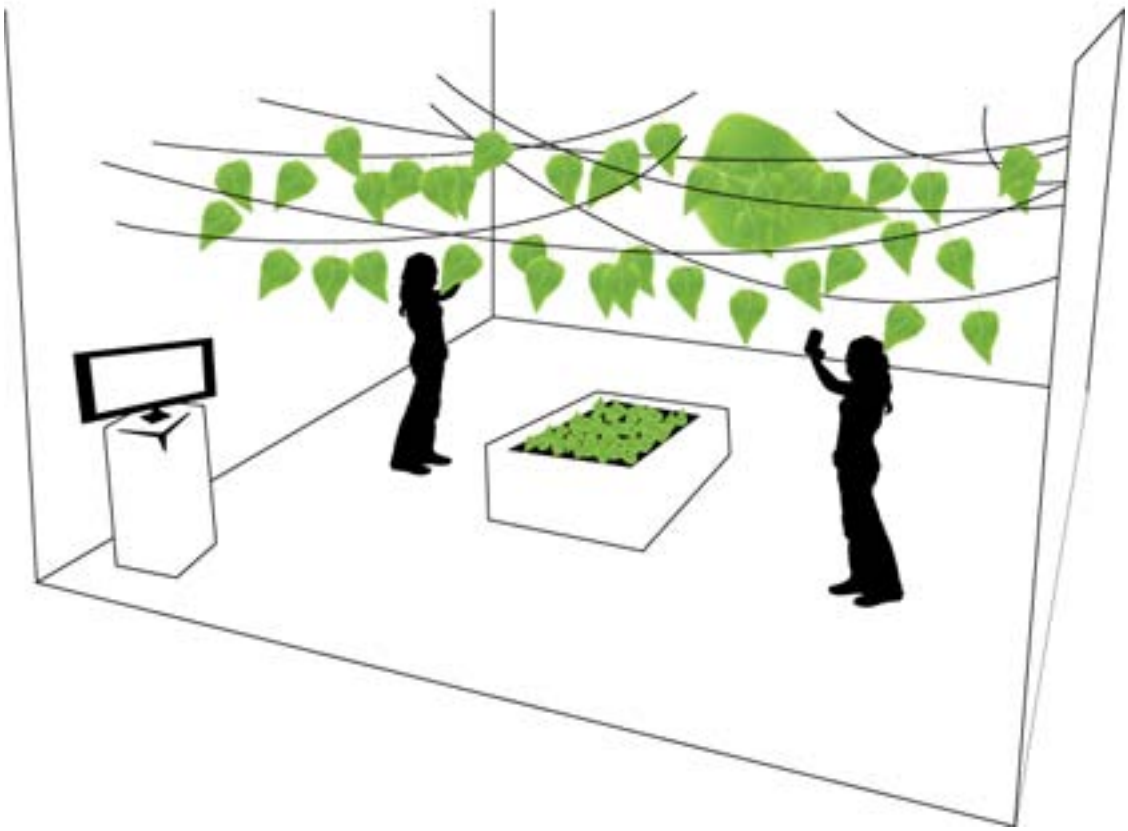
Eric Klopfer [9] argues that augmented reality applications "can place learners in real-world contexts that promote transfer of learning from one context to another".

As Chris Dede and Sasha Barab observed about the qualities of immersive learning environments: "The more a virtual immersive experience is based on design strategies that combine actional, symbolic, and sensory factors, the greater the participant's sus-

pension of disbelief that she or he is 'inside' a digitally enhanced setting. Studies have shown that immersion in a digital environment can enhance education in at least three ways: multiple perspectives, situated learning, and transfer"[10].

Dunleavy et al. [11] have pointed out that AR simulations can create engaging, collaborative environments based on particularly effective situated-learning techniques.

Several comparative studies have been conducted to evaluate differences between AR-enhanced learning practices and traditional processes [12-14] and some key findings show that AR can be particularly effective in fostering personal (and social) engagement in learning situations that invite learners to actively explore open-ended problems and multiple pathways (within mixed realities and real-world settings).



LEAF++: A PLATORM FOR CONNECTIVE ENVIRONMENTAL EDUCATION

LEAF++ is an ubiquitous, interstitial information tool for a new vision which, through augmented reality, enables the creation of an additional layer on our visual landscape. It is designed as a new "eye" that can be used to look at the natural landscape, in particular leaves.

When a photo of a plant leaf is taken with the camera of a smart phone, a pre-trained 3D feature recognition system scans the shape, trying to identify some specific com-

ponents. When these elements are recognized, the system retrieves and shows content from selected sources (descriptive texts about species, habitat, edibility, warning about poisons, threats, endangered status and more). Additional content ranges from videos of interviews from local wildlife experts to picture stories told by plant lovers or recipes and herbal properties for medicinal use.

A CMS (Content Management System) allows users to organize and publish specific content on the physical objects (e.g. the leaves). The CMS is built upon a WordPress engine that has been modified in order to enable multi-author and collaborative functionalities. Through the CMS users can collectively work on the multimedia content associated to a single physical object, thus creating a dense matrix of dialogic notes.

LEAF++ aims then at designing a disseminated, ubiquitous, accessible form of interaction with the natural environment which allows the creation of a suggestive, exciting and, most of all, desirable and accessible contact with the knowledge, wisdom and awareness about the inhabitants of the natural ecosystem in our surroundings as they are seen, interpreted and codified in people's minds.

METHODOLOGY AND TECHNICAL DESCRIPTION

The LEAF++ project has been designed and implemented through the following methodological steps:

☐ initial briefing, which produced the definition of the concept;

☐ the choice and experimentation of several technologies which could be used to realize the concept;

☐ the design and implementation of several prototypes, which were used in an iterative, participatory process;

☐ the generalization of the best prototypal solutions into an open platform;

☐ the use of the resulting platform to create two use cases, for education and artistic performance.

LEAF++ acts then as a means to define new cognitive landscapes. A cognitive landscape can be thought of as the result of the mental elaboration by every organism of the perceived surroundings. [15]

In this mindset, we described a series of operational objectives, which later formed

the concept for LEAF++:

☐ to create a tool for vision or, even more desirably, a new or mediated vision;

☐ to create an accessible and natural interaction metaphor, as close as possible to the practices to those which we are accustomed to; one which is easily executable by a wide range of persons across cultures, age groups, skills;

☐ to create an open platform, distributed as documented Open Source software, so that it will, in and of itself, create an active ecosystem of practitioners wishing to use and modify it to enable more practices and possibilities for vision, awareness, understanding, expression and ubiquitous knowledge sharing;

☐ to create a usable information and interaction layer that is easily hooked onto the elements of the natural environment and that is accessible through mobile devices;

☐ to create a process which harmoniously conforms with the processes of our vision; just as we interpret what we see geometrically, symbolically, culturally or through our memories, experiences and relationships, LEAF++ should progressively populate our mediated field of vision with aesthetics, information, knowledge, possibilities for relation, understanding and interaction, just as details progressively emerge while we look at things;

☐ to design a platform that fosters collaborative educational processes and practices;

☐ to create an aesthetic, sensorially stimulating, cognitively suggestive experience; one which is able to trigger wonder and emotion, to inspire action and participation, to activate cultures and open dialogues.

Along the lines defined by these objectives the research group set forth in designing the process which was to be then implemented.

The most pressing point turned out to be one regarding the ability to characterize LEAF++ as a "vision". Current augmented reality systems did not completely satisfy us with their interaction metaphors and in the composition of their interfaces as most of them heavily relied on movie-generated ideas of what an augmented reality interface should look like: radars, sonars, floating icons and other visual assets seemed to create videogame-like experiences that, while being usable and (in some cases) wonderful to look at, did not match the feel and aesthetics of the "new vision" which we wanted to produce. Our desire was to create a lens, a see-through transparency onto which the additional information layer would visualize in the most natural possible way.

Another of the more pressing characteristics which we wished to research was the bypassing of the limits imposed by GPS, compass and accelerometer driven augmented reality systems and to create an experience that was strongly based on (computer) vision. Furthermore, the invasiveness of the marker-based versions of AR techniques did not

seem to fit in with the goals of the project.

One of the objectives which we regarded as being not only strategic but also fundamental in promoting the vision which is defined by the LEAF++ project was the requirement for openness of the technologies used and produced in the process. Due to this consideration the research team opted not to use any of the existing commercial (even if free) platforms that are currently available to perform computer vision based AR. We chose to develop our own technology and to release it for open usage to the international scientific and artistic community (the source code of all software used in LEAF++ is currently available on the project's website under a GPL3 license). The production of an open, working platform is, in fact, one of the most outstanding results of the project, and it fully supports the idea of open, accessible knowledge which we tried to enact in the natural ecosystem by engaging the making of LEAF++.

During the second phase of the project, the technological architecture was defined.

We chose to develop a mobile AR browser with the characteristics defined during the previous stage. The chosen mobile platform was developed for Apple's iPhone, mostly due to the availability of a stable development environment and for its ease of use – to satisfy the requirements in terms of accessibility and usability – and due to the availability of multiple international development groups dealing with computer vision issues such as the ones involved in the project, thus allowing us to establish an effective mutual collaboration which proved to be both effective and rewarding.

The platform which was created for LEAF++ is composed by the following elements:

- ☐ a trainable computer vision module
- ☐ a CMS (Content Management System)
- ☐ a service infrastructure

A computer vision (CV) module is used to provide image recognition features to the system. The CV module uses SURF (Speeded Up Robust Features) algorithms and techniques to identify the various types of leaves. The SURF image detection techniques and descriptors described in [16] are used in the system together with a customized version of the optimizations described in [17].

Specifically, the CV component is integrated in a system enacting the following process:

- ☐ acquisition
- ☐ generation of feature descriptors
- ☐ classification and initial configuration of the CMS

A guided procedure allows the user to capture all the images that are required to correctly identify the relevant visual features of the leaves that are to be added to the system.

In the next phase of the process an interface is used to navigate the groups of images of each feature and to use them in generating the SURF descriptors that will be used in the end system. Each descriptor uses information captured by the images as suggested in [16] and [17] to create the data that is needed for the realtime image recognition process. An initial version of the descriptor is generated automatically and the user is guided through a series of iterations whose objective is to refine this initial information, thus producing a better, more efficient, descriptor: by iteratively modifying selected parameters, and using the leaves in front of the camera, the expected results are compared to the effective ones, thus identifying the needed modifications to the descriptors.

At the end of the process each one of them is associated to a series of keywords establishing a taxonomy whose nodes are associated to the visual elements of the various types of leaves.

This taxonomy is used in the CMS. The CMS is implemented using a customized version of the Wordpress content management platform. The taxonomy produced in the previous phase is reproduced inside Wordpress under the form of a "customized taxonomy". Using the standard features of the CMS it is, thus, possible to associate multimedia content (videos, sounds, texts, documents and interactive experiences) to each part of the taxonomy and, therefore, to the visual elements of the types of leaves that have been added to the system.

The service infrastructure is used to bring all parts of the system together for the usage experience. A series of software components that can be readily integrated into iPhone applications connect to the device's webcam and enact the realtime feature recognition process. When a leaf is recognized, its identification is translated into a series of terms in the custom taxonomy and relevant content is fetched over the network by interrogating the modified Wordpress CMS. The multimedia assets are then progressively shown onto the smartphone's viewfinder, coherently with the realtime onscreen position of the leaf.

RESULTS

Although still at an early stage, this project shows promising directions to enhance current educational practices for environmental sciences. The open platform produced during the project is currently being used for two specific purposes:

- ☐ connective education processes
- ☐ an art performance.

The platform behind LEAF++ allows all subjects involved to create ubiquitous education, knowledge sharing and information dissemination processes. FakePress Publishing is currently using this platform to create several multi-author publications on the themes of ecology, sustainability and food and dietary education, producing information facilities that are ubiquitously accessible about the natural seasonal availability of vegetables, their origins and characteristics, creating enjoyable, suggestive and interesting ways to

re-connect with the knowledge and traditional wisdom about food and environment.

LEAF++ is also being used for the execution of an art performance in which the system is not connected to a set of databases containing information but, rather, to a generative audio and video engine. In this "concert for augmented leaves" the performers use the leaves in front of cameras to generate suggestive audio and visuals. The performance is currently being developed into a fully participatory experience in which the audience takes the role of the performers and is free to move around urban space and generating the audio and video collectively, by augmented-looking at the leaves that come across.

Several authors recently argued that AR-based learning tools pose new technological, managerial and cognitive challenges to teaching and learning [11], [18], [9]. Within this rather recent research agenda, the contribution of LEAF++ is to investigate some of these challenges, creating an AR-enhanced connective ecosystem to be freely distributed to the international community of educators and therefore to be tested on a wider variety of research projects.

We hope that LEAF++ ecosystem can constitute a connective educational platform that contributes to raising people's awareness of the precious and fragile complexity of all the Third Landscapes that surround us.

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Fig. 1. LEAF++ Architectural Diagram, 2009, FakePress Publishing, (courtesy of the authors)

Fig. 2. LEAF++ Architectural Diagram, 2009, FakePress Publishing, (courtesy of the authors)

Fig. 3. LEAF++ A prototypal interface for education, 2009, FakePress Publishing, (courtesy of the authors)

The Sky Is Falling (A Day in the Life…)

Michael Demers

Rhizome Curated ArtBase, New Museum, New York, NY

White Columns Curated Artist Registry, New York, NY

TINT Arts Lab, London, UK

Asnuntuck Community College, Enfield, CT

ABSTRACT

Elder Scrolls IV: Oblivion / 12:00am to 11:50pm, Heartfire 11, 3E433

Auto refreshing digital video, 24 two-minute segments.

Keywords: Digital art, new media, virtual space, Playstation 3, Elder Scrolls, browser, Internet.

INTRODUCTION

This work consists of captured Sony PlayStation3 video from Elder Scrolls IV: Oblivion, edited to reflect the seamless passing of game time and "real" time. One minute of "real" time equals approximately 30 minutes of game time. The resulting 24 two-minute videos record the passing of one game day.

References to playable characters, AI characters, and accompanying sound effects have been edited from the video in an effort to focus on the notion of a virtual space with the possibility of non-virtual habitation, defined in part by the passing of game time during the observers "real" time. The health meter, magic meter, stamina meter, weapon and magic selections and the game compass have been unedited as a digital referent in the hyperreal environment of the game engine.

The footage was captured using the Haupauge HD PVR, and edited on a MacBook Pro using Final Cut Pro. The 24 html pages were built in Adobe Dreamweaver, and use javascript to call a specific page (and the embedded video) based upon the users local time (ex: If someone is viewing the page at 3:40pm local time, video15, containing footage from 3:00 to 3:59pm game time, will be played). An additional piece of javascript tells the browser to refresh itself every two minutes, to ensure that subsequent videos will load appropriately.

THE WORK

View the work online at http://michaeldemers.com/theskyisfalling_terminal/

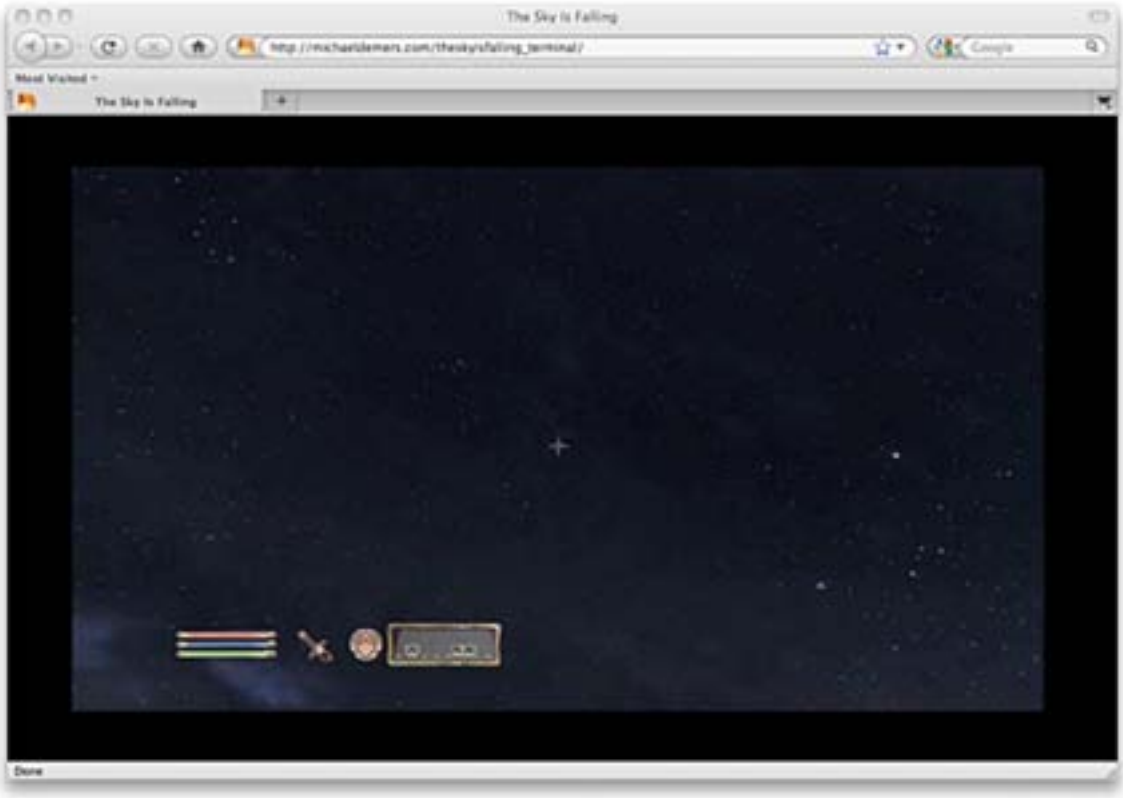

Image 1

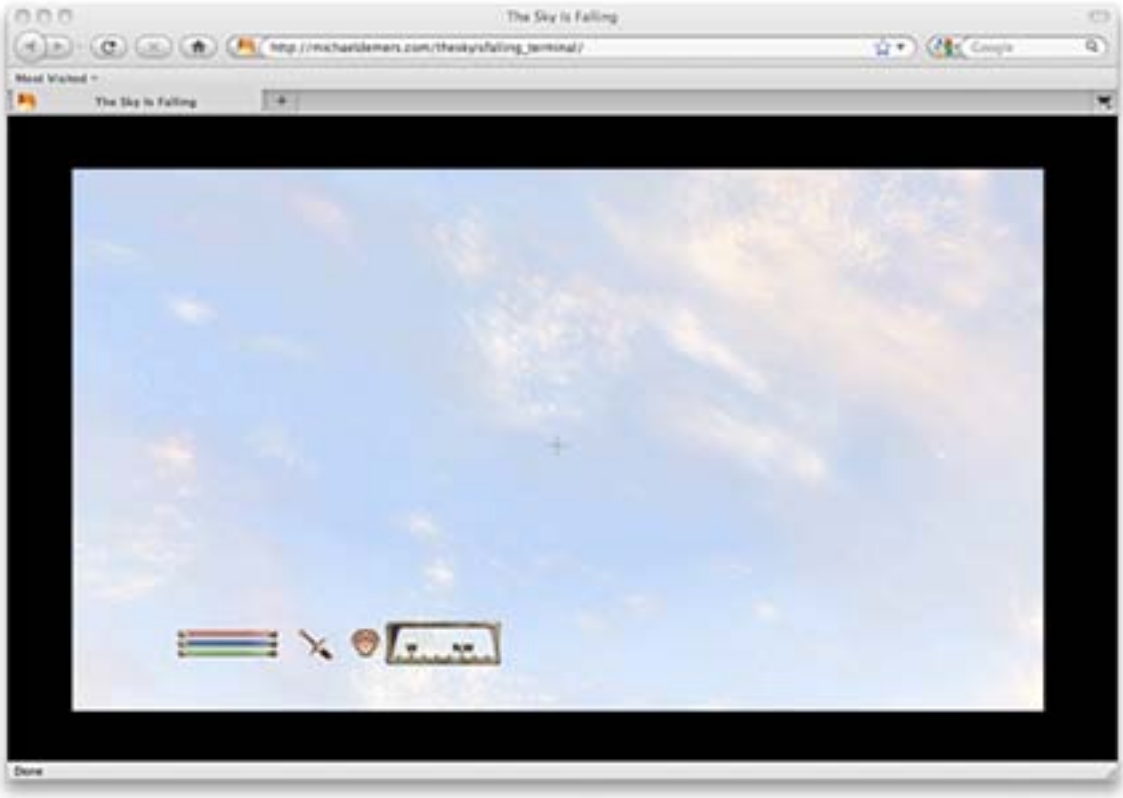

Image 2

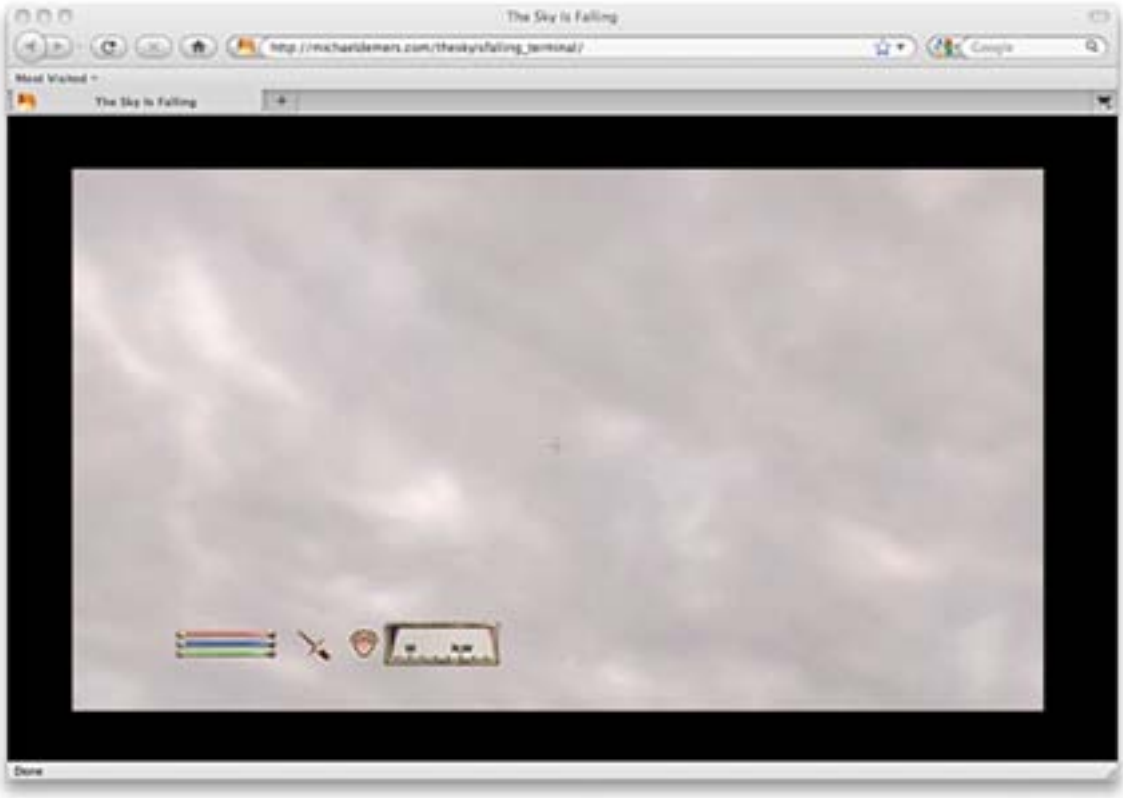

Image 3

Section 7
Interactive
Performance Spaces

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FUTURE LEARNING SPACES

Aalto-ADA 2/2012

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the 7th annual conference in the Designs on E-Learning series.

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which is based at the University of the Arts London.

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