Adapting to Changing Landscapes in Education (On Microlearning)

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Abstract: While we are currently witnessing the renaissance of Tim Berners-Lee's original vision for a Two-Way-Web, many institutions in higher education still develop and maintain landscapes of tools and services that largely ignore the ongoing power-shift towards the individual. This paper argues that these institutional landscapes need to be reorganised and changed into *augmented landscapes,* in which the application of individually selected and maintained, multi-purpose tools and services becomes possible. Some implications for individuals and institutions in higher education are discussed.

1. Technology enhanced teaching and learning and the renaissance of the Two-Way Web

Since the late 1990's personal authoring and publishing systems that radically simplify content publication and processing on the Web have grown exponentially in popularity and distribution. Especially the wide distribution of authoring systems for Weblogs and Wikis has triggered the emergence of a whole ecology of tools and services sometimes labelled "social software".

This development could be interpreted as the expression of a counter-movement to the early years of the World Wide Web, in which content creation and publication increasingly required very differentiated knowledge and skills. It seems like we are currently witnessing the renaissance of Tim Berners-Lee's (2000) original vision for a Two-Way-Web that not only provides sophisticated means for information retrieval but also enables people hold very little technical knowledge to tap into the World Wide Web as a productive environment for publication, social networking, and collaboration.

Many lightweight, cost-efficient systems and tools have emerged in the personal Web publishing realm, including varied content management systems, content syndication and

aggregation services, and a range of tracking and mapping tools of hyperlink economies and social networks (Paquet, 2003). These tools offer powerful means for the support of collaborative and individual learning activities that adhere to the patterns of contemporary information-intensive work outside of formal educational settings (see for example, Kelly, 1994), such as the formation of conversational networks (Fiedler, 2003).

This approach stands in contrast to technologically enhanced teaching and learning, which is still largely based on a „gift-wrapping approach" (Fischer & Sharff, 1998). In many cases in formal education, new media and computational tools are simply wrapped around existing educational philosophies and methodologies that treat poeple mainly as consumers, while the design and production of instructional materials and interventions is mostly reserved for professional educational authorities.

However, the traditional approach of curricular planning and micro-management of instructional materials, environments, and interventions for rather homogeneous target groups increasingly reaches its limits (Gordon & Zemke, 2000; Gustafson & Branch, 1997). The sustainability of traditional models becomes more and more questionable in the light of widespread access to information, artefacts, and patterns of meanings in almost any field. These models cannot adequately address the increasing individualization, limited predictability, and enormous situation- and context-dependency of learning needs as they occur in work processes that are largely focusing on the production of new artefacts. Outside of formal educational contexts, situational demands in many areas of work do not allow people to wait for the provision of instructional materials and interventions by professional trainers and educational authorities – instead they need to negotiate and support their own learning through non-designed instruction (Resnick, 1987). It appears that many people will have to execute instructional activities and tasks (e.g. needs analysis, selection of adequate resources, determination of criteria for success and quality, etc.), which under conventional conditions were provided by the pedagogical establishment (Candy, 1991).

This requires also a more individual and emancipated approach to the integration of ICTs into one's own workflows. Currently institutions in higher education do not support this systematically. The landscapes of tools and services that they tend to provide, or rather prescribe, are often set up as rather closed systems that reduce most people to consumers of a fixed set of selected, pre-designed functionalities.

2. Institutional Landscapes of tools and services

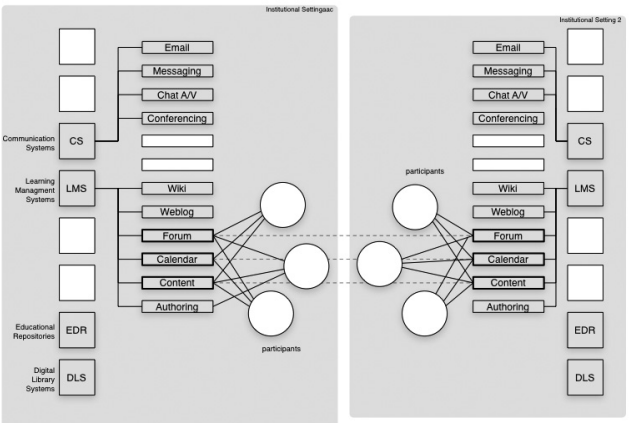

Figure1: Institutional Landscape

Figure 1 depicts the mainstream scheme where institutionally hosted and maintained Communication Systems, Learning Management Systems (LMSs), Educational (Learning Object) Repositories, Digital Library Systems, and so forth, are considered to constitute a comprehensive landscape of tools and services for the technological support of teaching and studying activities. Many institutions in higher education seem to strive for such an extensive in-house offer, though only a few organizations have been able to ensure an entirely homogenous landscape. Thus, it is quite common that various Learning Management Systems are in use even within a single institution. The same variability holds true, of course, if one compares different institutions.

This situation creates numerous challenges for all kinds of collaborative activities amongst users of different systems. Some systems might interoperate to a certain degree, but in general educators and students face considerable problems when they need or want to collaborate in a setting that transcends these institutional landscapes.

From an observer's perspective, all actors appear as „residents" who perform all necessary activities within the institutionally hosted landscape of technical tools and serv-

ices. This, of course, is hardly ever an adequate description of all actors, since individuals choose to use all kinds of communication systems that are not provided and hosted by the educational institution, such as e-mail or instant messaging. However, many institutional policies are still based on the illusion that all relevant technical support and mediation happens (and should happen) within the institutional boundaries. In addition, very often security aspects are mentioned as one of the main arguments against any liberalisation and opening of the institutional landscape.

3. Individual landscapes of tools and services

In parallel to this trend of building comprehensive institutional landscapes of tools and services, recent years have seen the emergence of an "avant-garde" of people who have started to create and enhance their own personal learning environments through a portfolio of selected software tools and services (see figure 2).

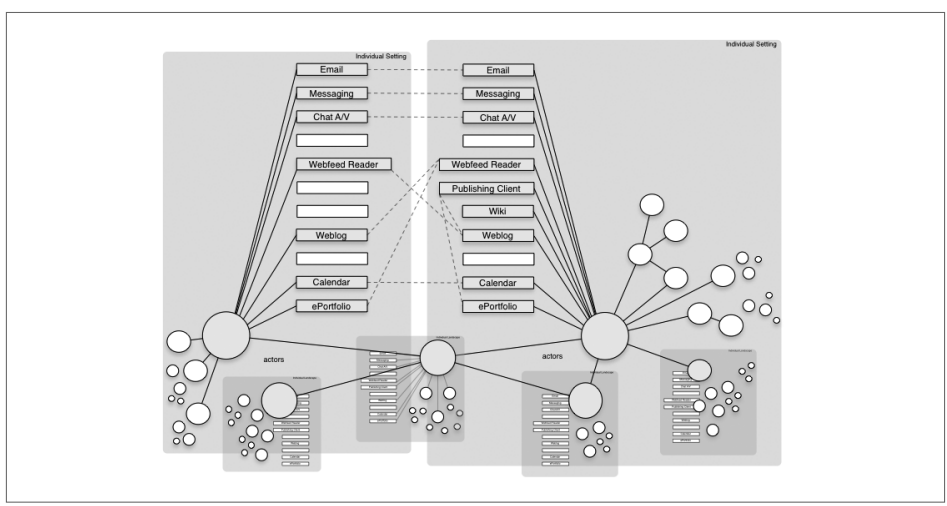

Figure 2: Individual Landscape

Individuals in figure 2 have the means and capabilities to construct and maintain their personal landscape. For example, they make intensive use of various kinds of networked tools and services to establish new relationships with others and to construct

extended social networks to support their own educational projects (Efimova & Fiedler, 2004). They largely take responsibility for all necessary instructional functions, such as selecting and acquiring material resources, pacing and monitoring themselves, establishing criteria of evaluation, generating feedback, and so forth.

These people might maintain only loose connections with formal education. In some cases, their only point of connection with a formal educational institution might be an attempt to receive official accreditation for skills and knowledge they have acquired elsewhere.

From an observer's point of view these people could be described as „nomads" who wander around only following their individual interests and needs. They might periodically join projects, groups and alliances but essentially they operate mostly from a psychological perspective of autodidaxy (Candy, 1991).

4. Augmented landscapes of tools and services

At this point in time, adults who support their personal learning and change projects with their own landscapes of networked tools and services, clearly form a minority. In addition, very few formal educational institutions are ready for the accreditation of skills, knowledge, or even competencies (see Erpenbeck & Heyse, 1999) that someone acquired in informal contexts and through autodidactic activities.

Nevertheless, we believe that formal educational institutions will increasingly face people who choose to support their learning and change projects with small, loosely-coupled, personal tools and services that are networked and either live on their individual hardware or simply somewhere outside of the institutional landscapes. These people will be reluctant to change their personal workflows and preferred tools to adapt to institutionally hosted systems that essentially offer the same or very similar functionalities.

The current discussions in Europe regarding the mobility of adult learners and the related EQF (European Qualification Framework) provide further argument for this development. The EQF is focusing on learning outcomes. Adults will be able to obtain a certificate from any qualified authority by providing evidence of their competencies. It does not

matter where or how the individual acquired them. These political and strategic efforts might also support a more individualistic approach in terms of technology support.

We thus maintain that institutions should start to support the emergence of *augmented landscapes,* in which individual tools and services can inter-operate on various levels with tools and services that are provided by the educational institution.

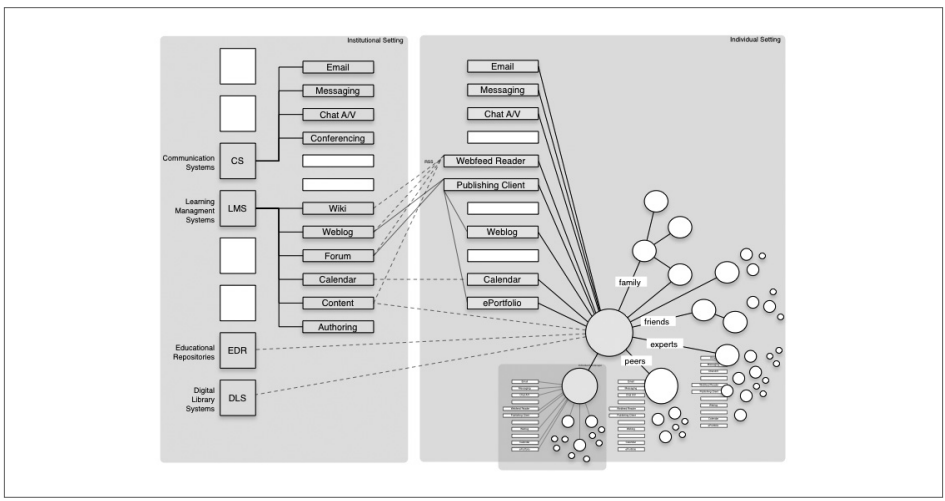

Figure 3: Augmented Landscape

While the institution would still provide some core tools and services, individual actors could then also choose from a growing variety of options of free or low-cost tools and services. Depending on their preferences, technological means, and capabilities, individuals could still decide to use specific subsets of tools and services from an institutionally provided palette, but they would be free to gradually transcend the institutional landscapes according to their needs.

From an observer's point of view these actors appear in relation to institutional landscapes either as „emigrants or immigrants" who leave or join the technological infrastructure for particular purposes. In some cases they might start within the institutional landscape where they first make us of some centrally provided tools and services, before they choose to set up and integrate a more individual landscape. Others already

bring along an elaborate individual landscape of tools and services and only choose to partially make use of the institutional offers.

A practical example of such an approach can be found in the Weblog authoring realm. While it is possible to author most Weblogs via Web-interfaces and a general purpose Web browser, there is a number of specialized, desktop-based Editing clients available (Ecto, Qumana, MarsEdit, etc.) that can "talk to" numerous publishing systems via a small set of APIs that handle the necessary client-server exchange. This allows authors to customize their workflow, write and edit contributions offline, and manage the access to numerous publishing outlets. Together with Webfeed reading clients these editors form a powerful content creation and publishing workbench that exists independently of all the actual content management and publishing systems one might want to connect to.

In figure 3 we try to visualize what this could mean in a formal educational context. A facilitator could choose to support a given teaching and learning project with an institutionally hosted Learning Management System that offers, for example, the use of a Weblog, Discussion Forum, Wiki, Calendar, and Content authoring and management features. On the other side, individuals who maintain their own landscape of tools and services could simply use a Webfeed reading client to aggregate and monitor the different flows that are produced within the LMS, and an individual publishing client that could talk to all these different publishing spaces and formats (Weblog, Wiki, Forum, and so forth).

5. Implications for individual actors and institutions in higher education

Such an approach has various implications. First, responsibilities are distributed differently. All participants need to take responsibility for the selection, configuration and maintenance of personal tools and services. This includes facilitators and students. In fact, the boundaries between facilitators and students get mostly blurred, since all participants have access to the same, or very similar, set of individual tools and services. Hierarchies as the ones maintained by the classical LMSs vanish. The institution might offer a core set of tools and services but it would not try to determine entirely what peo-

ple could choose. It would also ensure that everything that is offered complies to open standards and can interoperate with a whole range of tools and services that live outside of the institutional boundaries.

In addition, all actors need to build up a set of individual workflows that allow for mediated, conversational exchanges (Harri-Augstein & Thomas, 1991) around digital artefacts with peers and facilitators. These workflows should serve a whole range of purposes that are ideally not limited to the formal educational context. Again, using general aggregating and publishing tools and services make a good example for what we have in mind here.

This, of course, requires not only the development of particular skills and knowledge but also a set of values and attitudes that allow for the successful participation in more open and unstructured environments (Heyse et al., 2002) We are not arguing here that students should be left alone with this developmental challenge. Instead, we suggest that formal educational institutions would be well advised to actively challenge and support students' acquisition of necessary means. Some institutions have started to define and teach pre-requisite skills and knowledge regarding the use of ICTs and digital media in higher education. However, the skills and knowledge that are needed to operate successfully in an institutional landscape of centrally hosted tools and services, differ considerably from what is takes to set up and maintain an individual landscape.

Here we have to take some normative decisions. Do we expect adult students merely to adapt to centrally hosted and controlled landscapes of tools and services? Or do we rather maintain a perspective of (technological) emancipation, which suggests that adults should also control, at least partially, the tools and services that they integrate into their personal workflows?
In an era in which many individuals are regularly forced into self-organizing activities of various kinds, it is not really hard to find good reasons for trying to establish a certain level of self-control over networked ICTs and accompanying workflows amongst adult students. In many cases organisational affiliations do not last long enough to justify the adaptation and change of personal workflows to proprietary institutional solutions.

Instead, higher education should support and reflect such emancipating perspective through an adequate re-structuring of their landscapes of tools and services. Of course,

such a move inevitably carries along a declining controllability of what people "actually" do and what tools and services they use to accomplish their personal goals. Needless to say that this runs counter to many institutional policies that are currently trying to re-engineer higher education from a business or industrial production perspective.

Nevertheless, we want to suggest that an augmented landscape approach as we have sketched it above, also offers a whole variety of educational opportunities. From a learning environment design perspective, new formats of exchange, collaboration and engagement become possible. The ongoing development of micro-formats (ref.??) and affordable, networked tools and services that inter-operate indicate a power-shift towards the individual. This has already become visible in certain parts of society and for certain working environments in creative industries, journalism, small-scale consulting, and so forth. An augmented landscape approach would offer the opportunity to set up environments that largely simulate how ICTs are already used within authentic work settings.

From a perspective of competence advancement such an approach allows for the construction of all kinds of challenging situations where individuals have to execute tasks and solve problems beyond the mere domain-specific teaching and studying. For example, self-directing, collaborating, and social-networking activities can be treated as discrete areas of challenge in contexts where mediated communication and expression are necessary and wanted. Augmented landscapes would put an emphasis on the individual's mastering of tools and services. The individual's social networking activities, for example, might be supported in a way that is not only of limited use within the immediate formal educational context but that holds the potential to be a viable solution for a range of purposes in various contexts.

In the research project *iCamp*, which is funded by the European Union under the 6th Framework Programme, we are currently addressing some of these challenges with a group of researchers across Europe. By providing individuals and institutions with a set of interoperable tools and services – the iCamp building blocks – we want to support the creation of augmented landscapes. This work in progress has already revealed some of the difficulties described above.

6. Conclusion

Though many institutions in higher education still focus on the development of rather closed and comprehensive institutional landscapes of tools and services, it sonly seems to be a matter of time before students and educators will begin to challenge this approach to technological enhanced teaching and learning on a more regular basis. The centralised, controlled manner in which many institutions try to organise and prescribe the technological infrastructure for both students and educators in formal educational programs, does not reflect the various developments that are driving the ongoing renaissance of the Two-Way Web and the necessary technological emancipation of individuals.

We believe that these institutional landscapes of tools and services in higher education need to be restructured to allow for interoperability with general purpose tools and services that can be selected, combined and adapted by individuals according to their needs and purposes. The ongoing development in the personal publishing and social software realm of various kinds of micro-formats, APIs, and desktop clients for aggregating, authoring, and publishing, point into a promising direction. The educational design and technology community would be well advised to pay attention to these trends and to begin with the re-organisation and opening of the current set of tools and services to more individualised and emancipated approaches to technology enhanced teaching and learning.

We also tried to touch upon the fact that these issues are loaded with philosophical and political questions that can only be resolved by taking some normative decisions. In higher education we see no need to reduce adults to mere consumers of centrally controlled and prescribed tools and services. In the realm of personal publishing and social software people are very well able use effectively networked tools and services that are only loosely-coupled and that partially "live" on their personal hardware and partially on a multitude of servers.

As soon as we move into the realm of higher education and the technological support of teaching and learning, the very same people are suddenly not considered to be able to execute a similar level of personal responsibility and agency any more. We think that this view is severely limiting and produces a sort of self-fulfilling prophecy for what is possible in terms of individual technological emancipation in higher education. The development towards augmented landscapes, as we sketched them out above, is in

large parts already feasible and would offer various educational opportunities. We consider such a re-organisation to be an appropriate, transitional step. In our view, there are many good reasons why higher education should try hard to enable all its participants to manage individual landscapes of tools and services to enhance their own learning and change projects within and beyond formal educational contexts and institutional boundaries.

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