E-LEARNING ENVIRONMENTS AS NICHE STRATEGY TO MATCH THE 'DNA' OF A PARTICULAR UNIVERSITY

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Abstract

Currently many eLearning platforms exist that are offered by other universities which are simply deploying eLearning technologies as media streams or online courses. The clear aim of this position paper is to find the essence where diverse universities will be able to compete on the education market in the digital future by reducing teaching costs, finding an innovative model fitting to specific strategies and especially the "DNA" of the university: strategies, industrial collaboration, departments, student needs, and administration. An adaptation of existing solutions shall be avoided to find a particular digital education profile in the field of the university context. Education by extended the existing BSc., MSc. and PhD. studies. The outcome of the presentation shall be: 1) a strategy discussion for the next 5-10 years; 2) presentation of reference pilots of introducing eLearning environments within 3 online courses that were conducted previously; and 3) a presentation of a setup test-platform and curriculum that shall extend courses step-by-step towards a fully new digital eLearning experience.

Keywords: eLearning, university strategies, education, digital universities.

1 Introduction

Currently many eLearning platforms exist that are offered by MIT, Berkeley, or Oxford which are simply deploying eLearning technologies as media streams or online courses. The clear aim of this application is to find the essence where smaller scale universities will be able to compete on the education market in the digital future by reducing teaching costs, finding an innovative model fitting to the university specific strategies and "DNA" of the university: strategies, industrial collaboration, departments, student needs, and administration. The idea that universities have to identify their own "DNA" is based on (Christensen & Eyring 2011). This work describes why certain university models fail, and why some university models succeed by identifying their own way who to cope with the intensified competition of universities. The difference to existing solutions shall be the vision of creating a fresh-innovative-competitive-digital environment to improve the "DNA" of the university rather than simply adapting existing solutions or re-attempting to establish failures of other projects. It aims at a partial transition of university learning environment towards an eLearning environment within a few years' time with a full-scale deployment thereafter. The paper attempts to investigate suitable teaching curricula that shall fit under the larger context and extend the existing media technology and management BSc. It especially shall delivery teaching and studying to BSc., MSc. and PhD studies.

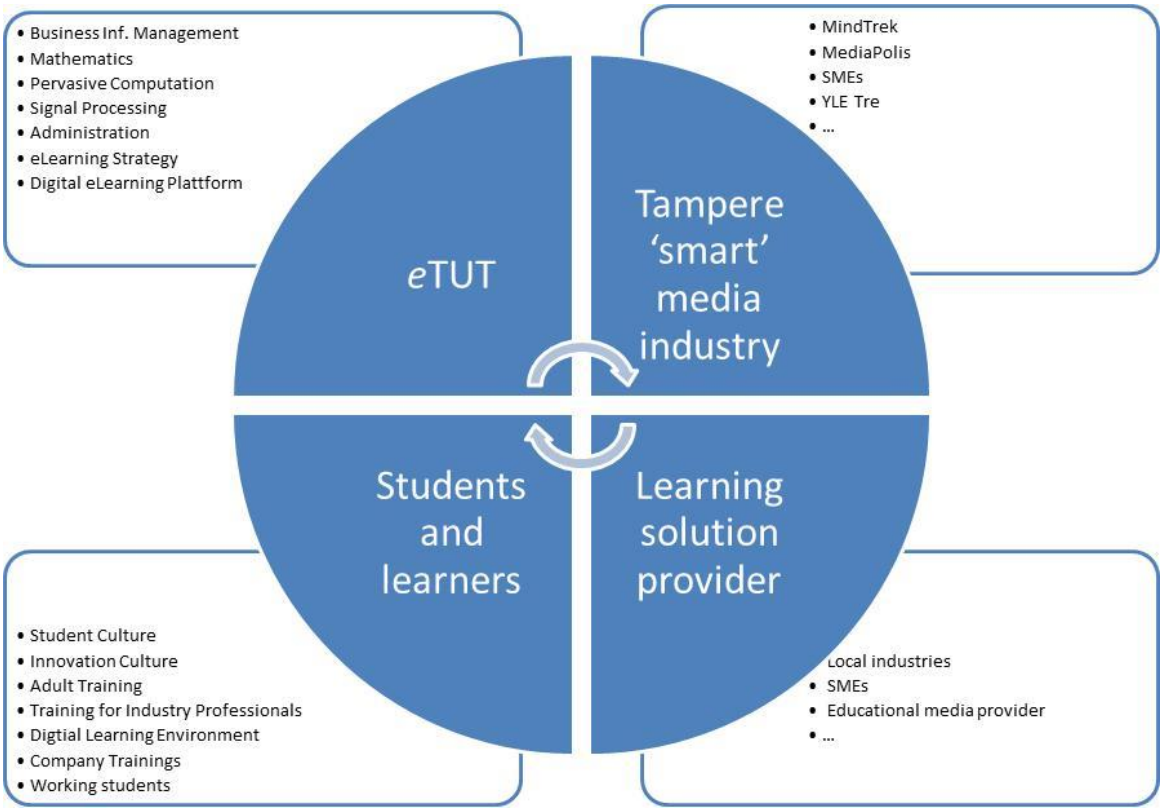

Figure 1. Overview of embedding a university between the local environment, learning solution providers, students, and learners.

Many times media are simply viewed as TV, books, and newspapers – but in the context of this application media are considered as smart digital media environments in contexts. Currently the level of media and multimedia teaching is de-creasing, while digital media in various forms are increasing and require well-educated digital media experts capable of coping with intelligent technologies, management of digital services, and content creation. The aim to present efforts conducted within the NAMU research Lab, and the EMMi Lab. at the Tampere Univ. Of Technology (TUT) to visualize possible efforts in introducing eLearning into media management, hypermedia, and pervasive computation under one umbrella. The presentation of this position paper discussed previous efforts, and how a university could transit towards a digital university on a larger scale.

The advantages of a niche eLearning strategy are manifold: the university as forerunner in utilizing eLearning technologies with a niche strategy to compete with big players; involvement of Finnish SMEs providing eLearning technologies in the planning process; year-around university offerings; keeping the student base steady, rather than a selective process; standardized and modular teaching curriculum; high cost savings (especially by cutting administrative costs); enables education of off-campus students (e.g. employees, PhD students); partially solves the long-term student problematic; integration of distributed campuses and tighter cooperation between universities of offered courses); increased cross-department cooperation; and as well keeping tuition fee 'free' by reducing costs.

Within the scope of this presentation, lessons learned from the following practical lectures using latest eLearning technologies are presented (see references):

- joint virtual lecture over the Internet between Staffordshire University, UK and the Ambient Mobile Multimedia Seminar held at the Tampere University of Technology, Finland;
- cooperation lectures with Magedeburg of Applied Sciences, Germany (incl. student exchange) to demonstrate the use of latest communication technologies, and online course technologies;

- cooperative short movie production with Loyola Marymount University, Los Angeles, USA to demonstrate the ability to introduce collaborative eLearning environments into the creation process of creative art projects;
- establishment of a virtual project office for conducting European wide R&D within the UMEDIA NoE.

The presentation of the position paper shall conclude with a discussion of a project proposal that was submitted to develop eTUT – a strategy towards introducing a large scale eLearning environment at the Tampere Univ. of Technology in Finland.

During the previous years, several experimental settings have be conducted to experiment with new ways of teaching, especially emphasizing new digital technologies, teaching spread across universities worldwide, and the introduction of new didactics. A general overview about the research group activities can be found in (Lugmayr 2012). Learning-by-doing lecturing, as well as the utilization of latest digital motion picture technology has been applied within the scope of a seminar at TUT (Lugmayr et al. 2008). A major integral component in teaching was the introduction of 'Design Thinking' as method for teaching (see (Lugmayr 2011)) either within the scope of local courses, or in cooperation courses with other universities (see (Lugmayr et al. 2011)). One very important key-work in the definition of the "DNA" of the university is (Christensen & Eyring 2011), a work that is advised to be read. In the future, the following book will be published (Lugmayr & Vogel 2014) and act as a reverence work for future scientists in their career building process.

2 European Wide Virtual Project Office – 'Digitally' Managing a Large Scale NoE Partner Network

The NoE "UMEDIA" project proposal has been submitted to the European Union in 2002 under the framework programme 6 for the IST call FP6-2002-IST-1 in the subtheme 2.3.1.8. "Networked Audio-Visual Systems and Home Platforms". The total project volume was approx. 9M Euros. The project proposal has been hosted by the *Digital Media Institute (DMI)* directed by Prof. Dr. Hannu Esoka at the Tampere University of Technology (TUT). The project clustered more than 80 partners (45 academic partners, 30 industrial partners, with a SME rate of 30%) and ranged over 19 nations worldwide, and included over 100 researchers (with over 80 registered PhD students. To cope with the challenges of such a large scale project, it was organized in an onion skin structure, where 10 core partners are responsible for the general project policies, and the core network included 40-60 researcher. Besides the scientific challenges of the project, the project developed a model that should act as reference model for the integration of fragmented R&D in Europe to obtain one excellent 'virtual' research laboratory. The challenges to develop the virtual research laboratory were tremendous, and included: creation of an organizational and management model, introducing a quality and excellence control mechanism, modelling of processes to integrate common research actions, guaranteeing socio-economic and political impact, and pioneering the way how integrated research is conducted to build the *European Research Agenda (ERA)*.

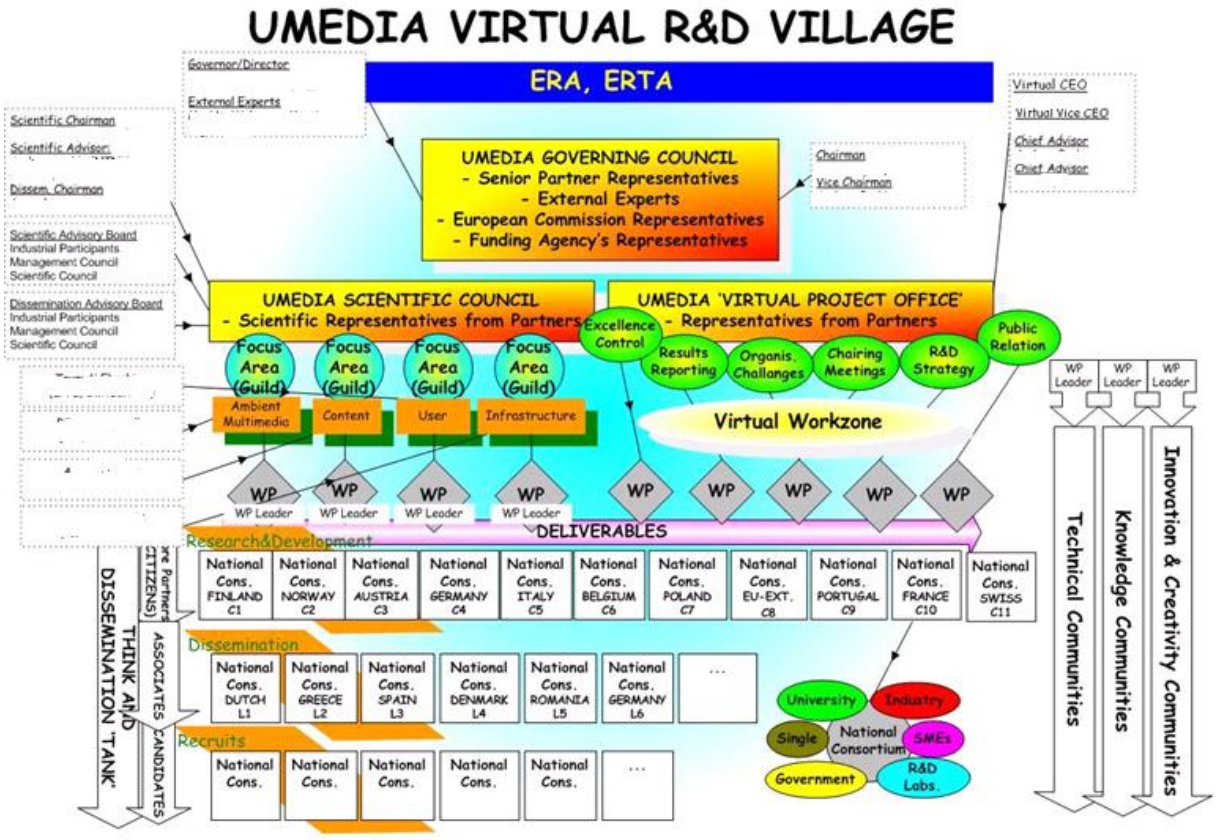

Figure 2. UMEDIA Virtual Organization Model including the Virtual Project Office

The network gathered all leading partners who played a major role in the development of media technologies, and ought to pioneer the reference strategy for the creation of a European wide integrated R&D network. On scientific level, the aim was to develop the notion of ambient media, which is currently publicised under ubiquitous computation, pervasive computation, or smart media (see e.g. (Lugmayr et al. 2013)). The aim was to protect European wide leadership in science, technology, and the commercialisation of its results in this research domain. The tight integration of existing test-beds, pilot demonstrations, and continuous creation of project spin-offs should guarantee the establishment of an international recognized concept enabling the provision of a public available knowledge pool in the wider field of media. To achieve this goal, the UMEDIA model included the following key-issues:

- *virtual UMEDIA organization:* the core solution to cope with the challenges of European wide distributed research work was the establishment of a virtual organization model, that also included a virtual project office (see Figure 2);
- *evolving excellent and strong R&D management model:* development of a management model capable of leading a large-scale consortium spread over the world to maintain the policy goals of the EU given be the Lisbon treaty, and ERA;
- *partner integration models:* integration of activities related to R&D, such as teaching, research work, networking, standardization activities, existing partner networks, and common dissemination of results;
- *thematic integration of multidisciplinary partner:* integration of inter-disciplinary partners by focus areas concentrating on different scientific perspectives (content, user, infrastructure, and technology);

- *cost-function for qualitatively measuring EU wide R&D 'de-fragmentation':* development of the UMDIA 'de-fragmentation algorithm' as quantitative measurement of integration efforts, as well as actions to outside the network (e.g. for dissemination);
- *cross-linkage of several stakeholders:* linkage of several stakeholders, in particular research institution, industry, national policies, European Commission, and standardization bodies;
- *introduction of a bonus system for performers:* to evaluate performance of partners and UMEDIA in total, a point system was developed that has been adopted from the Finnish university funding to measure and reward successful integration actions;
- *integration of large scale industries and SMEs:* maintaining tight links to national industries and SMEs to allow an active commercialization of research results;
- *maintaining the leadership function with committed excellent researchers:* development of excellence criteria and a quality control to keep the network as a world leading knowledge platform for ambient media;
- *creation of a sustainable super-network of networks:* financial sustainability through high industrial participation, subscription based services for industry/the public, public funding from national funding bodies, and continuous fund raising beyond the project duration;

The virtual UMEDIA office already pioneered many currently emerging living laboratories, innovation centres, or other virtual cross-border research networks. It provided a common technology infrastructure and piloting infrastructure to partners. The hierarchical organizational model was in principle divided into two components: the UMEDIA scientific council responsible for leading research activities; and the UMEDIA virtual project office providing the administrative support for the network. The aim was to strictly separate R&D integration and administrative tasks. R&D was considered to be border free, and only limited national cooperation was allowed as part of the research agreement. The division into national consortia related solely to the administrative processes and tasks. Thus national consortia were only administrative units due to national characteristics in applying for funding, country specific laws, SME strategies, and the optimal dissemination of results. The virtual UMEDIA office followed common international practises as demonstrated by ISO, ETSI, W3C or MPEG. To ease commercialization efforts this division allowed to threshold easy manageability and a more flexible partner structure towards future integration efforts. It also provided the advantage, that particular research results commercialization and dissemination cold optimally be adapted to national characteristics.

On the other hand, the separation allowed a worldwide integration of a network of researches through focus areas. Each focus area thematically clustered researchers and allowed the organization of particular research actions within work packages. Additional features particularly relevant for the integration of research work included the creation of knowledge communities, where work-package leaders were provided with an additional instrument to take actions. At the stage of the proposal a particular focus was on the creation of innovation & creativity communities to allow the emergence of new products and their commercialisation.

3 Worldwide Inter-University Cooperation to Supporting Common Teaching and Lectures

Within the scope of this chapter, a few successful and unsuccessful settings for online teaching are discussed. Each of the cases is examined according used teaching modality, technology, and didactic aspects. Let's begin by examining the unsuccessful cases. In 2005 we arranged a joint virtual lecture of the Interent between Staffordshire University and the NAMU (New Ambient MUltimedia Lab.) at the Tampere Univ. of Technology (TUT). The goal was to train students in digital culture, have common online discussions, go through online publications, and conduct common assignments. From

the technology perspective, the course was very well equipped: online platform, online discussion forum, assignment submission system, and online lectures. The course was conducted, but did not achieve the goals that we set at the beginning. It was rather tricky to integrate students and allow an efficient virtual communication via our online platform with each other. The main identified reason were the different teaching modalities at the universities. Engineering students at TUT were used to a lecture based approach, where they had to do assignments in addition in their spare time. The different teaching modalities were rather conflicting, and it was extremely tricky to motivate students to have common lectures to discuss with their peers at the partner university. One major drawback of how we arranged the lectures was the lack of face-to-face meetings, which was tricky considering the lack of travel budget for the lectures. The main 'lecture' was to be learned for teaching staff: without face-to-face meetings, and the integration of courses with fully different teaching modalities is rather tricky. There needs to be much more emphasis on integrating the modality of courses beforehand and to apply other methods for teaching than we did. The selection of methods should enable a better integration of students to achieve more online discussions and better collaboration.

A more successful cooperation took place in the year 2012, where we conducted a cooperation lecture between the Magdeburg University of Applied Sciences, Germany. The goal of the lecture was to apply the method 'Design Thinking' to develop media products of the future. To avoid a lack of student integration, we arranged face-to-face lectures with additional remote lectures that took place before and after the student exchange. The face-to-face lectures before the exchange helped to integrate students and initiated group collaborations. During the course that took place in a face-to-face setting, students worked on the practical works that are typical for 'Design Thinking'. Thus students evaluated the end-users, developed ideas of possible practical solutions, and implemented rapid prototypes to test these. By having a week available, where students worked on a face-to-face basis together, we avoided that students don't get well integrated beyond the face-to-face lectures. From the technology side, we utilized email lists, online web-portal, Moodle, Google documents, Skype, and Dropbox. These technologies were rather sufficient to support common student activities. Nevertheless, due to the different course schedules at both universities, after face-to-face lectures common activities were rather tricky to arrange.

Another cooperation between the Loyola Marymount University, Los Angeles, USA and TUT was attempted in the year 2008. The aim of the course was to have a common lecture between engineering students, and film students. The idea of the lecture was to create a High-Definition (HD) movie in front of blue-screen. Each team of student was responsible for giving an interview about the other location in front of a blue-screen. Backgrounds where exchanged between students, and edited together. The lecture was very well planned, and we were able to create the final film-material. From the technology side, we utilized the simplest solutions for communication (Skype) and FTP for file-exchanges. This provided to be sufficient for the scope of this way of teaching. We also planned the student tasks very careful beforehand, and that these can be separated carefully.

4 Discussion & Conclusions

As concluded in (Lugmayr 2012; Lugmayr n.d.), the most significant issues in the process of establishing a creative research laboratory are:

- motivation of students by introducing new lectures, projects, and courses fostering creative thinking;
- creating multi-disciplinary teams, and offering cross-disciplinary approaches to allow new pathways in media education and the development of new ideas;
- creating a concise vision for motivating students to develop ideas beyond the state of the art as main motivation factor;
- continuous re-invention of methods, teaching curricula, and project themes to motivate students;
- student driven – bottom up methods of teaching to enable self-innovation and letting students work on own ideas;

- multidisciplinary education of the principal investigator to be able to create the right mode for interdisciplinary discussions, and communications;
- strong marketing, branding, and clear setting of the common vision to create a feeling that ideas will have impact;
- user experience, technology, and content creation as triangle especially suited in the field of media education;
- virtual cooperation platform as the basis of location dispersed teaching and learning and active use of latest IT infrastructure;
- involvement of team members at an early stage of studies, to enable them higher level activities such as conference organization, common research group tasks, organizational tasks, and funding applications;
- teaching as a matter of motivation, rather than simply gathering credit points or good results to keep the innovative spirit;
- consistent vision and strategy towards the creation of new knowledge and scientific pathways and outcomes;

This position paper shall identify possible directions to establish eLearning environments in a larger context, pinpoint to possible implementation pitfalls, and identify the key-issues of creating a virtual campus. In fall 2013, EMMi Lab. will start a trail in educating PhD students via an online platform to allow teaching via distance, and provide students with the possibility to do their studies within the scope of their professional work. As far the following key-issues can be identified:

- virtual cooperation platform as the base platform for location dispersed teaching and learning, which should include: video platform of lectures, assignments collection, forum to discuss between students, repository for background literature, communication between student and teacher;
- selection of suitable methods to remotely work on common publications, experiments, and enable discussions between student colleagues;
- providing the students the possibility to remotely manage administrative and organizational tasks such as record management, yearly subscription, course signups, and access to IT infrastructure;
- tightly embedding of activities into the university eco-system, including its innovation environment, local initiatives, existing infrastructure, and local service providers;
- the university as environment has to provide basic infrastructure such as eLearning tools (e.g. Moodle, online webhotels, administrative tools, document repositories and discussion forums) to allow a single research group to easily setup new activities;
- development of university fitting strategies that are capable of serving local industry and stakeholders as a resource for knowledge, applied research, and scientific results;
- cost savings through the introduction of new technologies by cutting e.g. administrative costs through standardized and modular curricula supported by online teaching platform;
- investigation of the university's own "DNA" to create a novel approach towards eLearning fitting to students' cultural aspects, optimal information systems, investigation of financial savings, modularization of curricula, avoidance of the adaptation of existing models to create a niche profile, and their suitability for eLearning;
- smaller scale tests of an eLearning platform to allow experimentation and fast adoption of new strategies;
- development of a new curricula suitable to cope with the latest challenges and educational needs across platforms and in cooperation with students, industry, and other local stakeholders.

Currently the development of the online platform is still under progress, and will be only tested in a small scale with PhD students. It's understandable, that many obstacles and pitfalls are not considered yet and will need to be resolved during the process of establishing the virtual laboratory.

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